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ABSTRACT

The reported study was conducted to determine the extent to which active participants of a Citizen's Advisory Committee (CAC) were representative of the general public in land and water resource attitudes. All 39 members of the Maumee River Basin Level B CAC and a random sample of 400 Basin residents were given a Likert-type scale to measure their attitudes about land and water resources, the effectiveness of governmental leaders and agencies with these resources, and the role that citizens and the government should have in land and water resource decisions. Demographic data were also collected. Although the CAC members were not demographically reflective of the general public of the Basin, it was concluded that they were reflective of the public in terms of attitudes toward land and water resources and the role of government and the citizen in land and water resource decisions. (MR)

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Attitudes of the Public and Citizen Advisory Committee Members Toward Land and Water Resources in the Maumee River Basin

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By

Calvin Lee Taylor, B.S., M.P.A.

* * * * *

The Ohio State University

1977

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Interactions in Natural Resources Management, Alternative Futures in Natural Resources Management, Simulation in Natural Resources Management, and Energy Resources Management. Dr. John F. Disinger.

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Attitudes of the Public and Citizen Advisory Committee
Members Toward Land and Water Resources in the
Maumee River Basin
By
Calvin Lee Taylor, Ph.D.
The Ohio State University, 1977
Professor J. Robert Warmbrod, Adviser

The extent to which the active participants of a Citizen's Advisory Committee (CAC) were representative of the general public in land and water resource matters was examined in this investigation. Specifically, the study focused upon whether the Maumee River Basin Level B CAC members were representative of the Maumee River Basin residents of northwestern Ohio. Representativeness was examined through comparison of attitudes toward land and water resources and demographic characteristics.

All 39 CAC members and a random sample of 400 residents were administered a Likert-type scale to measure their attitudes about land and water resources, the effectiveness of governmental leaders and agencies (institutions) responsible for land and water resource matters, and the role that citizens and the government should have in land and water resource decisions. Each respondent was also asked to provide demographic data. The instrument was pre-tested and then administered through three sequential waves of mail to both CAC members and the sampled public.

The CAC members and the general public responded favorably toward positive statements about land and water resources and about the role of the citizen and the government in land and water resource matters. Both groups recognized the importance of land and water resources and the need to consider all factors and interests when improving the use of those resources. There was general agreement that the government should not have more say than it now has in land use decisions.

The general public was not as well informed as were the CAC members about the effectiveness of government leaders and agencies in land and water resource matters. The CAC members were also more critical about the effectiveness of those governmental institutions.

The demographic characteristics of the CAC members were not reflective of those of the general public. The CAC members tended to be white collar persons with higher educational achievements and higher incomes. In comparison with the general public, the CAC members were also more politically active.

It was concluded that the Maumee River Basin Level B Citizen's Advisory Committee was representative of the general public within the Basin in terms of attitudes toward land and water resources, and the role of government and the citizen in land and water resource decisions. The two groups were not alike in their attitudes toward effectiveness of governmental agencies on demographic characteristics. Although both groups responded similarly to general attitude statements, the CAC was more knowledgeable about land and water resource matters than was the general public. Based upon the results of other related research studies and the findings of this investigation, it could also be concluded that the CAC members were characteristic of community leaders in terms of land and water resource matters.

I. INTRODUCTION

The natural resources of air, water and land have provided an environment that mankind has learned to use to supply basic needs of food, fiber and shelter. These resources have supplied the raw materials that have been utilized in numerous ways through the application of technological innovations. This "progress" has allowed countries such as the United States to increase its standard of living in terms of material goods. For many decades, Americans have implicitly equated an increased material standard of living with a higher "quality of life."

Over the years, scientific discoveries and technological developments have helped advance the United States in terms of world leadership and power. At the same time, these discoveries and developments have had other effects that have only recently gained national prominence and acceptance by many persons as problems. Progress, in many instances, has had degrading and detrimental effects upon the same natural resources to which it partially owes its advancement. The manufacturing of technological products inherently produces a number of by-products or wastes.

Until relatively recently in our development as a country, it has been assumed that such discards of manufacturing processes could be discharged into the air, deposited in the water or buried in the soil.

Such actions over the years have increased and accumulated to such an extent that in most situations the natural assimilative capacities of those resources to "cleanse" themselves have been exceeded or at least overloaded. Today, more and more people are realizing that the quality of life and the environment which supports that life have often been detrimentally affected in innocent attempts to advance the standard of living.

Although much needs to be learned about the effects of technological processes upon the natural resources of our environment, attention is now being focused upon new questions to which answers are not yet available or widely accepted. Can "...an acceptable balance of economic and social well-being be achieved within a context of a quality environment?" (Great Lakes Basin Commission, 1974b, p. i). When and how will a compromise be achieved between continued economic progress characteristic of a high-technology society, and restoration and maintenance of an acceptable quality environment?

Under the system of capitalism and democracy that prevail in the United States, it is safe to assume that the answers to these questions and other related ones concerning a technological-environmental quality balance should be developed through our governmental system. The traditional process of developing solutions to problems has been to enact legislation. It is likely that this approach will remain as a viable one. Environmental quality issues, such as pollution which recognizes neither political nor jurisdictional boundaries, have usually been approached with enactment of legislation.

The processes of problem-solving and decision-making in regard to problems has historically involved five recognizable sectors within our governmental system. These five sectors include: legislative, administrative, judicial, specially organized interests (e.g., lobbyists), and the public at-large. Each of these important groups has been involved to differing degrees over time in various actions concerning the solution to problems. Decisions concerning natural resources management and environmental quality protection have been no exception to the involvement of each of these sectors.

Some of the earliest notable resource management efforts in the United States occurred in the early 1900's (Johnson, 1951) with efforts to preserve forest lands for future generations. Those early efforts to retain a quality environment were led by such men as Theodore Roosevelt and Gifford Pinchot. Although efforts such as those made by these early conservationists continued in a relatively quiet manner, it was not until the 1960's that the environment became a major topic of American discussion and a national priority concern.

Throughout the development of the United States, the people have continued to participate in a democratic government. Participation usually has been relatively formal in the nature of testimony before Congressional sessions or as routine as casting votes for issues and candidates on ballots. These roles in the decision-making processes were determined to a large extent by the rise of "big" government following World War II (Kaynor & Howards, 1973; Rosenbaum, 1976). For nearly two decades following World War II, citizens, apparently overwhelmed by the technical expertise needed to evaluate government actions, focused their attention upon matters of broad policy. Throughout this span of time, however, a thread of concern with particulars of governmental action persisted (Kaynor & Howards, 1973). About the mid 1960's an increase in public concern became quite apparent. National issues such as involvement in an undeclared military conflict and environmental quality caused a renewed desire on the part of many persons to have their government hear their concerns, complaints, and recommendations. Many sectors of the public desired and even demanded a more active role in the decision-making processes of their government. Review and comment by the public on governmental actions was a desire expressed by many persons. Furthermore, the public requested the opportunity to have an active input into the formulation of decisions, programs, regulations, plans and other similar actions that would affect their lives. "Increasingly over the last decade, the confidence of citizens in their own judgements has grown with a corresponding reduction of confidence in the reliability of expert judgement" (Kaynor & Howards, 1973, p. i).

"Public participation" in the problem-solving and decision-making processes of governmental agencies on environmental and natural resource matters has continued to gain emphasis since the mid 1960's. Involvement by the public in social choice decisions is an integrally important part of our democratic system of government (Priscoli, 1975).

> Political scientists have become increasingly interested in the changing processes of decision-making in programs affecting natural resources. In the current climate of interest in the environmental consequences of such programs, the rise of public concern over what were once considered purely governmental actions not normally subject to question has emerged as a political fact of life with momentous significance....

> One can only speculate about whether or not the pendulum has swung too far. While many experts realize that a reluctance to accept their judgments as gospel is probably healthy, some appear uneasy about the apparent downgrading of their special contribution. They are particularly uncomfortable with the attitude, occasionally encountered, that their greater and more precise knowledge may sometimes be a deterent rather than an advantage in the making of decisions.
>
> Notwithstanding, a period of skepticism is now with us, and experts, like it or not, must now face the challenge of a public increasingly confident in its own ability to judge the consequences of governmental actions formerly accepted as too technical for the public to evaluate. This is a particularly noteworthy political innovation in the area of water resource development and mangement where technical knowledge is at a premium and where alternative actions may have important long-term consequences for the environment. (Kaynor & Howards, 1973, p. i)

The concerned public that supported environmental legislation during the 1960's and the 1970's has also assured continuing public input into governmental decisions involving environmental quality and natural resource management matters. Those historical laws that have already had far-reaching significance include provisions requiring involvement of the public in agency decision-making processes.

The most notable example of environmental legislation which requires public participation is the "Federal Water Pollution Control Act Amendments of 1972." Section 101 (e) of that Act states:

> "Public participation in the development, revision, and enforcement of any regulation, standard, effluent limitation, plan or program established by the Administrator or any State under this Act shall be provided for, encouraged, and assisted by the Administrator and the States. The Administrator, in cooperation with the States, shall develop and publish regulations specifying minimum guidelines for public participation in such processes."

Involvement of the public in the decisions concerning water resource and related land use activities has merit. Without public participation in these resource issues and problems, technical solutions are often misunderstood and the total program or planned actions are difficult to implement. "Unfortunately, advocating and requiring public participation is easier than designing programs for its implementation. The problems of the current, more innovative programs for integrating public participation into water resources planning are ample testimony of the difficulty of such implementation and design" (Priscoli, 1975, p. 1).

Several basic problems remain with public participation programs. One fundamental problem faced by governmental agencies responsible for assuring public involvement in water resource activities centers around the recruitment process through which citizen representatives are selected (Priscoli, 1975). This problem is intrinsically coupled with the problem of "representativeness" (Warner, 1971). Ideally, if citizens were surveyed and selected at random, they should be representative of the views, values, attitudes, perceptions, and levels of knowledge of the larger general populace from which they were selected. In practice, however, that idealism is modified by many practical constraints. Those constraints are manifested in such forms as apathy, perception of role, and lack of time to be actively involved. Some persons are indifferent or even apathetic (Kaynor & Howards, 1973) to involvement in governmental decisions concerning such matters as land and water resources. Still other persons lack the adequate time to become involved because of other commitments. Persons who become interested and involved in these types of activities are often the same persons who are solicited concerning their desire or willingness to be involved in future activities of a similar nature. The failure to achieve an acceptable level of "representativeness" in selection of citizens to participate in land and water resource decision-making activities is compounded by the discrepancy between citizens and agency personnel on the citizen's role. Citizens may see their role as representing the public while agency personnel, on the other hand, see citizens as identifiers of needs, agents for minimizing opposition, tradeoff calculators, promoters of plan acceptance, as well as articulators of public desires (Priscoli, 1975).

Selection of citizen participants can be informal and relatively closed (Priscoli, 1975). Agency personnel collect and consolidate the names of individuals from agency mailing lists and from other agencies. Historically, these names tend to be those of persons more actively interested in water resource and related land use matters. From these names, the involved agencies screen the names on the bases of some established criteria. Screening criteria may range from geographical location, to membership in special interest groups, to known perspectives on issues. Once screening is completed, the potential citizen participants are solicited as to their interest in being selected to represent other citizens in the matter. Based upon the responses to such an inquiry, the responsible agency then notifies the selected persons of their formal selection. Through this type of informal and closed selection process, the persons who are often unaware of the issues may still remain uninformed, uninvolved, and perhaps not adequately represented in future decisions which may affect them. "One of the major problems faced by planners today who seek a broader, 'more representative' public response is how to contact and involve such people so their interests and preferences can also be taken into account in the plan development process" (Warner, 1971, p. 162).

> Public participation efforts, especially in water resources planning have tended to involve disproportionately certain types of people and interest groups in the general population. This is not unexpected given the nature of participation patterns in our country and the factors which influence them. However, further research is needed with regard to two important aspects of such unbalanced participation rates. First, to what degree do the viewpoints of the active participants tend to reflect currently held or presently emerging opinions and values of the broader uninvolved population? Systematic sample surveys could begin to indicate prevailing tendencies in response to this point. (Warner, 1971, p. 196)

Before a selection process is discarded as unsuitable because of its failure to select persons representative of the general populace of an area in terms of values, desires, attitudes, perceptions, and levels of knowledge, the degree to which representativeness is present needs to be investigated. An instrument designed to measure such representativeness in an on-going governmental program could also be utilized as an appropriate pre-planning instrument to aid in the selection of persons representative of the larger populace. Likewise, the same instrument could be administered near the completion of the program to measure representativeness and as a diagnostic tool to determine the continuity of representativeness throughout the program.

Public participation in land and water resources planning programs of the broad and continuous type is a relatively untested and unproven concept from the standpoint of empirical evidence (Warner, 1971).

This research study will focus upon "representativeness" as an issue and problem in attempting to incorporate representative citizen views. The setting utilized to examine this issue and thus to advance knowledge in this area will be the Maumee River Basin Level B Study.

Problem Statement

Land, water, and air are the three life-supporting natural resources without which mankind could not exist. Especially during the twentieth century, we have attempted to learn more about these resources through research and development. Many of these earliest efforts of recent times have focused upon how the resources could be utilized through technological means to support the "progressive advancement" of the western world, and particularly the growth and development of the United States. More recently, interests have shifted toward the techniques of wiser utilization, protection of the quality of the resources, and exploration of alternative substitute resources for currently diminishing supplies of some resources. Throughout those years of learning more about the natural resources of land and water upon which we depend and which are being constantly affected by our decision-making activities, we have relatively ignored gaining a better understanding about how we have made those decisions or about the most effective manner in which to make those decisions.

Land, and its accompanying resources, has become a common denominator of environmental, economic, and social problems (League of Women Voters, 1976, p. 20) since it touches people's lives, supports their livelihoods, provides for their leisure, and allows fulfillment of their aspirations. Naturally then, attempts to resolve conflicting uses of land resources by competing interests usually meets with resistance while inflaming strong emotions. "The extreme sensitivity of land use goverance has resulted in numerous instances of conflict and confrontation between citizens and government" (Rosenbaum, 1976, p. 3).

"We are being reminded often these days, that the responsibility for protecting the land and its resources goes alongside the right to own land" (League of Women Voters, 1974, p. 3). In an effort to avoid some conflict and confrontation, planning has been accorded a more central role in the land use decision-making processes. Citizens are questioning traditional assumptions about the concepts of growth, development, and progress, with a resultant shift to more emphasis on human values and renewed concern about our natural land resources. Intertwined within the issues of land use goverance is a realm of considerations for the how, when, where, in what form, to what degree, and who should be involved in planning and decision-making activities that affect or determine the uses of land and its inherent resources. Should the government, the private land owner, the public, or a combination of any of these control, influence, guide, provide incentives, or do nothing in regards to land use questions? Is it just the kind of land use decisions that matter, or is it also who decides and administers, and by what means? These are all relevant questions that must be addressed through our society's democratic processes when confronting such topics as private property rights which have been traditionally accepted without much question. "American democracy was founded on principles of limited governmental authority and formal public accountability. These principles, so deeply embedded in American political culture, also furnish the intellectual roots of the contemporary movement for greater citizen participation in governmental decision making" (Rosenbaum, 1976, p. 1).

"The objectives of citizen involvement and the major issues of organizational structure have not been carefully considered by legislators, elected executives, and citizen leaders in most jurisdictions. Legislative mandates often derive more from conformity to current political fashion than from a well-conceived commitment to a particular idea of democratic participation. Clearly, there is a need for more explicit consideration and more precise specification of the objectives and structure of citizen involvement programs" (Rosenbaum, 1976, p. vii). This challenge requires more than the routine inclusion of mandates for effective or meaningful citizen involvement in legislative statutes. Although mandated, involvement of the public remains a vague and ambiguous area of knowledge based upon a lack of empirical data. "Given the lack of positive legislative direction, bureaucrats and administrators often define citizen involvement objectives in terms of their own priorities and functions..." (Rosenbaum, 1976, p. 1). It should not be surprising then that public participation in land and water resources planning, programs, and related activities remains a relatively untested and unproven concept (Warner, 1971, p. 194). Much polemic rhetoric has been offered on the subject of public involvement, but little research has been conducted and thus few data are available on any one of the various aspects of the concept.

"Public participation efforts, especially in water resources planning have tended to involve disproportionately certain types of people and interest groups in the general population. This is not unexpected given the nature of participation patterns in our country and the factors which influence them. However, further research is needed with regard to two important aspects of such unbalanced participation rates. First, to what degree do the viewpoints of the active participants tend to reflect currently held or presently emerging opinions and values of the broader uninvolved population? Systematic sample surveys could begin to indicate prevailing tendencies in response to this point" (Warner, 1971, p. 196).

This research is an exploratory attempt to advance a better understanding of the concept of "representativeness" of public involvement in land and water resources program decisions. Of all the land and water resources research studies completed, only a few have been concerned with the social variables, and even fewer have been done regarding attitudes. Only one study could be found that concentrated specifically upon the concept of representation and public involvement (Beatty & Pierce, 1976). This investigation centered upon these central questions: Does the Maumee Level B Citizens' Advisory Committee represent the Maumee River Basin residents? Are the CAC's socio-economic demographic characteristics and attitudes toward land and water resources matters similar to those of the general populace of the Basin?

The concept of representativeness may have many dimensions (Pitkin, 1967). "Thus, conclusions as to the level of representation can be based on several alternate criteria. Among the alternatives are the representative's actions, policy preferences, personal characteristics, and mode of selection. The choice of which criteria to employ depends largely on the nature of the representatives one is evaluating" (Beatty & Pierce, 1976, p. 1007).

In this research, the members of the Citizen's Advisory Committee were compared with the general public of the Maumee River Basin in terms of (a) their socio-economic characteristics, and (b) their attitudes toward specified aspects of land and water resources. Attitudinal responses were solicited toward the following: (a) land and water as resources; (b) the effectiveness of elected officials and governmental agencies (institutions) in making decisions concerning the uses of land and water resources; and (c) the role and involvement of the public and the various levels of government in making land use decisions. The analysis will compare the background characteristics of the CAC with those of the general public sample. In general, the more similar the distributions, the greater the level of "representativeness" of the CAC for the general public.

Objectives

The comparison of the general public of the Maumee River Basin with the Maumee Level B Study Citizen's Advisory Committee to determine how representative the latter was of the general public necessitates the examination of some operationally defined elements. Thus the specific objectives of this investigation were:

1. To determine the attitudinal responses of both the general public and the CAC towards (a) land and water resources, (b) the effectiveness of governmental institutions making decisions concerning those resources, and (c) the role of government and the citizen in those decisions.

2. To describe the demographic (socio-economic) characteristics of both the general public and the CAC.

3. To determine if the CAC did or did not represent the general public on each of the three areas of attitudinal responses and if the CAC was representative of the general public on demographic characteristics.

The Maumee River Basin Resources

The Maumee River Basin in northwestern Ohio has long been recognized as a productive agricultural region interspersed with two large, expanding metropolitan centers of growth and over six other community areas each of which contains more than 10,000 persons. The region (Figure 1) is also supportive of certain industrial concerns and provides water-borne commerce facilities at the second largest port on the Great Lakes. This blend of extensive agricultural land, intensive land use practices, and rapidly expanding urban growth has become evident in recent years. These conflicting and competing demands and pressures upon the limited resource base have evolved into water and related land use problems and issues. The resolution of those conflicts and the solution to those problems was a primary incentive for initiating the Maumee River Basin Level B Study.

The Maumee River Basin, the Maumee Bay through which waters of the Basin flow, and the western end of Lake Erie which receives those waters, are the components of a complex and somewhat unique land and water resources system. The Basin, the largest in the Great Lakes draining from the United States side, is characterized by a complex but

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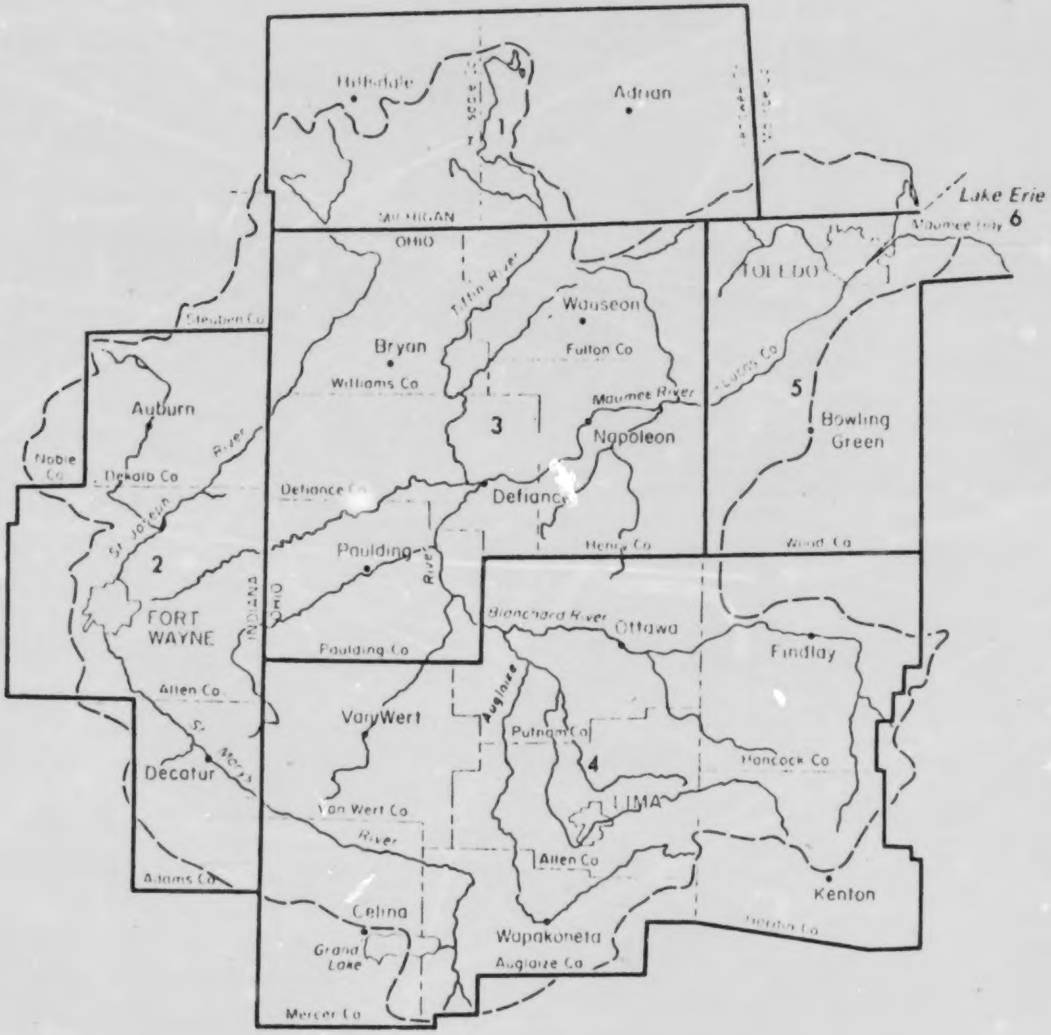
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Maumee Bay
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TOLEDO
Steuben Co
Tiffin River
Wauseon
Fulton Co
Bryan
Williams Co
Lucas Co
5
Maumee River
Napoleon
3
Bowling Green
Auburn
Noble Co
Dekalb Co
River
St. Joseph
Defiance Co
Defiance
2
Paulding
River
FORT WAYNE
INDIANA
OHIO
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Ottawa
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Paulding Co
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Putnam Co
4
Hancock Co
Decatur
LIMA
Van Wert Co
River
Allen Co
Adams Co
Kenton
Hardin Co
Celina
Wapakoneta
Grand Lake
Auglaize Co
Mercer Co

SOURCE: Great Lakes Basin Commission. Alternative Plans for Public Action. MRB Series No. 7 (Ann Arbor, Michigan, 1976), p. 1.

Figure 1. Maumee River Basin Region

diverse mixture of land, people, and problems derived from the conflicting and competing uses of the land and water resources by the people.

A river basin, such as the Maumee River Basin, can be simply defined as the entire land area drained by the primary river, the Maumee, and its tributaries. The Maumee River Basin (Figure 1) consists of about 19 counties in the tri-state area of northwestern Ohio, northeastern Indiana, and southeastern Michigan; 14 of those counties are located in the Ohio portion of the Basin.

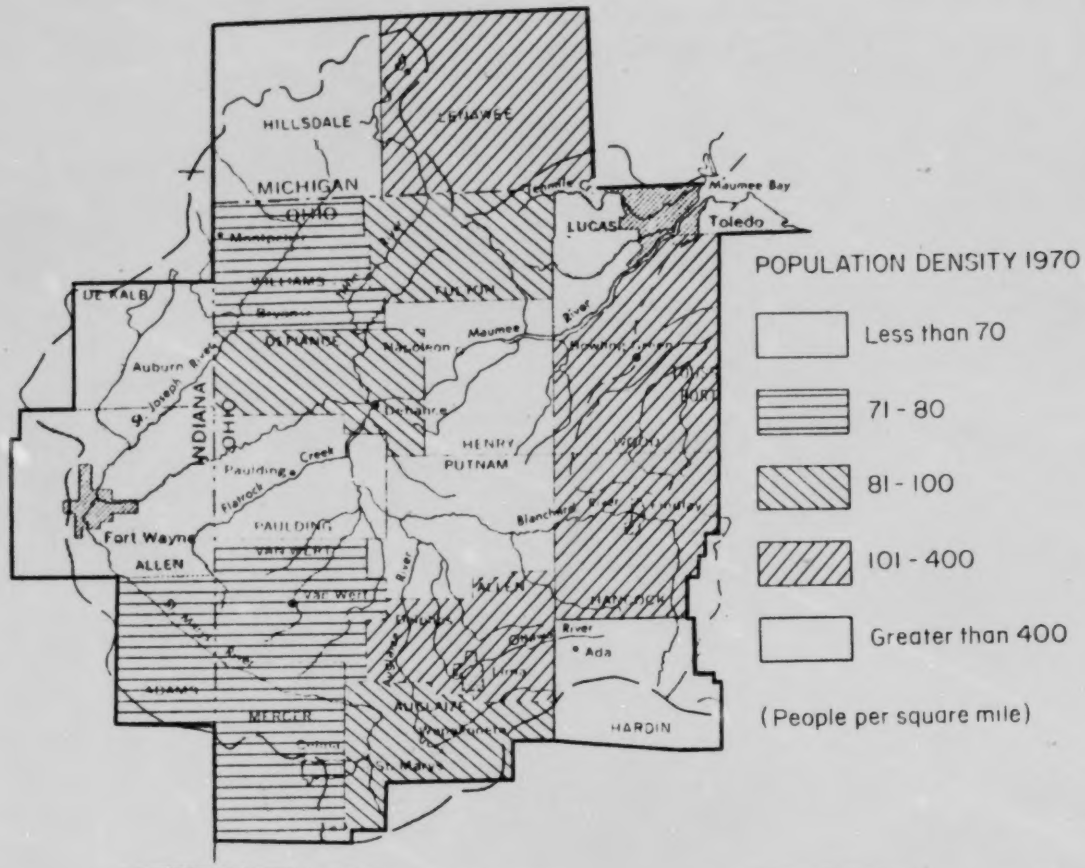
The lake bed of glacial Lake Maumee, formerly known as the Great Black Swamp, is the origin of the saucer-shaped Maumee River Basin. This glacial depression extends from the headwaters of the Maumee River in Ft. Wayne, Indiana to the river's outflow into Maumee Bay at Toledo, Ohio. The retreat of the last glacier about 14,000 years ago formed an unusual drainage pattern in which the St. Joseph and St. Marys Rivers which are tributaries to the Maumee River flow to the west to form the eastward flowing Maumee River.

The fine-textured glacial tills and lake-laid clays which have poor natural drainage attributed to the naming of the area as the Great Black Swamp by Indians and early fur trappers who journeyed through this portion of the Northwest Territory. Although swamp related disease and wetlands deterred many early settlers, by 1900 the agricultural character of the Maumee River Basin was firmly established. Clearing and draining the swamp by early farmers exposed vast areas of some of the most productive agricultural land in the Great Lakes region.

The expansion of agricultural activities within the Basin created the demand for supportive services to accomodate the needs of the predominantly agricultural community. These service centers for the dispersed farm population started as small rural villages and towns. Today, some of the Basin's larger cities are the result of growth and expansion of early towns, many of which are located near either the Maumee River or its major tributaries. The location of these service centers near navigable waterways provided an increased ability to ship and receive both raw materials and finished goods associated with the principal industries of the Basin: machinery, metal products, clay and glass, petroleum, chemicals, and food.

The land and water resources components of the Maumee River Basin system include approximately 5,700,000 acres of land (about 8,900 square miles) and 40,000 acres of water surface (GLBC, 1976a, p. 2). The land used for agriculture within the Basin consist of over 4.4 million acres as compared with about .47 million acres for urban uses. Productive agricultural land resources, however, continue to diminish as a national trend is exemplified in which expanding urban areas convert farm land to urban uses.

In 1970, the Maumee River Basin had a population (Figure 2) of 1,520,000 persons with nearly 70 percent of that population located in the three major metropolitan areas of Ft. Wayne, Indiana, and Lima and Toledo, Ohio. Other cities exceeding 10,000 people include the Ohio communities of Findlay, Defiance, Bowling Green, Maumee, Oregon, Sylvania, and Van Wert (GLBC, 1976b, p. 2-6). Between 1960 and 1970, population growth averaged 4 percent in rural areas as compared with an


HILLSDALE
LENAWEE
MICHIGAN
OHIO
LUCAS
Maumee Bay
Toledo
Montpelier
WILLIAMS
FULTON
DE KALB
Bryan
DEFIANCE
Napoleon
Maumee
River
Bowling Green
WOOD
Auburn
St. Joseph River
INDIANA
OHIO
Defiance
HENRY
PUTNAM
Paulding
Creek
Flatrock
PAULDING
Fort Wayne
ALLEN
VAN WERT
Van Wert
Blanchard River
Findlay
ALLEN
HANCOCK
Lima
Ottawa
River
Ada
ADAMS
MERCER
Celina
AUGLAIZE
Wapakoneta
St. Marys
HARDIN
POPULATION DENSITY 1970
Less than 70
71 - 80
81 - 100
101 - 400
Greater than 400
(People per square mile)

SOURCE: Great Lakes Basin Commission. Maumee River Basin Level B Study: Interim Report, A Presentation of First-Cut Planning. MRB Series No. 4 (Ann Arbor, Michigan, 1974), p. 9.

Figure 2. Maumee River Basin Population Density, 1970

average of 14 percent for urban areas. During this same period, about 65 percent of the total Basin growth occurred in Allen County (Ft. Wayne area), Indiana and Lucas and Wood Counties (Toledo area) in Ohio. The population density in 1970 varied from 46 people per square mile in Paulding County, Ohio to 1,412 people per square mile in Lucas County, Ohio. Future population growth is expected to continue at a slow to moderate rate throughout the Basin with the most growth continued to be focused in the three major metropolitan areas mentioned earlier (GLBC, 1976b, p. 2-7).

Problems and Issues of the Maumee River Basin

The diversity and intensity of land and water uses in the Maumee River Basin have resulted in conflicting and competing demands and pressures upon the natural resources of the Basin. While different individuals and interest groups would perhaps differ somewhat significantly in their identification of the problems, urgency of solution of the problems, and possible solutions to the problems and needs, some common problem categories have been identified: land resources management; erosion and sedimentation; flood plains; water quality; fish and wildlife; outdoor recreation; water supply; and a special category for Maumee Bay. Increased economic and population growth, coupled with inadequate public control and institutional gaps or jurisdictional disputes, as well as increased demands upon a limited resource base are some of the causes (GLBC, 1974b, p. 3) for the problems of the Basin.

The increasing conversion of productive agricultural land and other open space to urban uses such as suburbs and shopping centers has resulted from the inability of agricultural interests to compete with urban growth. The proliferation of urbanization has contributed to rising land costs, and uneconomical speculative taxation for agricultural land. These unconstrained trends have concurrently placed often excessive demands upon the local governments in their ability to provide utilities and services.

Intensive urban construction and agricultural land use practices have continued to allow unacceptable amounts of soil to enter streams and rivers. The Maumee River is one of the major contributors of sediment to the Great Lakes and is undoubtedly the largest contributor to Lake Erie through Maumee Bay.

The high clay content of soils, the lack of adequate tile drainage systems, and the improper location of structures in flood prone areas have all contributed to the potential flooding in the Basin. Encroachment on the natural flood plain has constrained the normal flow of waters.

The quality of water in the Basin has been adversely affected by contributions from urban, rural and natural sources. Combined storm and sanitary sewer discharges, including runoff from construction sites and streets, are all major contributors to lowered water quality in many areas. The rural sources include sheet erosion, pesticide runoff, and animal waste discharges from agricultural lands. Other sources include fertilizer and septic tank fields as well as road deicing salts and extractive mining processes.

The quality, quantity, dispersion, location, and nature of the remaining fish and wildlife habitat are concerns that are related to the use of other supportive and related natural resources. The decreasing amount of suitable fish and wildlife habitat is due largely to the problems of degraded water quality and the diminishing amount and quality of habitat. The decreasing abundance of habitat is the result of intensive and extensive land use practices.

As with fish and wildlife areas, a concern shared with outdoor recreational interests is the increasing inability of the public to use such lands. The need for additional land and water oriented outdoor recreational opportunities and facilities is particularly acute adjacent to urban areas.

Water supply from both surface and underground sources is apparently available in sufficient quantities throughout the Maumee Basin to meet present and future anticipated demands (GLBC, 1976b, p. 3-36); however, some portions of the Basin, such as the Fort Wayne, Indiana area may require additional supplies to meet future growth needs. The calcium bicarbonate, or hardness, content of much of the water in northwest Ohio results in additional water supply treatment needs.

The Maumee River Basin is the temporary recipient of waters flowing from the Maumee River and the Basin as a whole. Thus the Maumee Bay becomes an integral part of the land and water system that begins in the upstream watersheds of the Maumee River Basin and eventually reaches the western end of Lake Erie. The Bay also has many of the previous categories of problems characteristic of the Maumee River Basin. In addition, the Maumee Bay is characterized by the Lake Erie tidal influences arising because of its intermediate location between the Basin and the Lake. The importance of the Maumee Bay as a separate problem category is exemplified not only by these reasons, but also because of its importance in supporting navigation. The necessity to support navigation for the Toledo port commerce, in turn, necessitates the dredging of sediment deposited in the Maumee Bay from upland areas.

Maumee River Basin Level B Study

"Level B" studies of regional river basins such as the Maumee Basin are a part of the water resources planning and management process initially enabled by the Water Resources Planning Act of 1965 (Public Law 89-80). Title III of that legislation provided for annual Federal/State matching assistance grants to applicant states that desired to expand their state agency water resources planning staff capabilities. Secion 201(b) of that Act enabled interested states to request mutually the establishment of an interstate river basin commission for the purpose of coordinating water resources planning and management activities among those states; the river basin commissions also include all Federal agencies having a responsibility or an interest in water resources. The Act also established the Water Resources Council. The Council was established to provide a coordinative mechanism among the various Federal water resources agencies, and its members consisted of those Federal agencies. The Council was invested with the responsibility to conduct studies concerning water and related land resources and to coordinate water and related land resources policies and programs. The Water Resources Council also reviews general program directions and provides guidance for studies conducted by river basin commissions such as the Great Lakes Basin Commission under whose coordination the Maumee River Basin Level B Study was completed in 1976. The conduct of Level B studies was strengthened through Section 209 of The Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500) which required such studies to be completed for all major river basins throughout the United States.

The Maumee River Basin Level B Study was a coordinated State, Federal, regional and local effort to plan for the best use of the Maumee River Basin's land and water resources in both the immediate future and the more distant future. The Level B Study was comprehensive in scope by addressing multiple objectives through the utilization of numerous diverse disciplines and extensive expertise. The complex interrelationships of land and water resources, their uses, and their management focus upon the need for coordinated planning. The problems and issues associated with these natural resources as well as possibly the solutions to these concerns transcend established jurisdictional and political boundaries. For example, agricultural activities, highway construction, subdivision development and other land use activities in upstream counties of a watershed such as the Maumee River Basin can cause sedimentation, pollution, or flow changes which may adversely affect the water supply treatment costs, the fishing opportunities, and the navigation abilities of persons desiring to utilize the resource in downstream counties. The Maumee Level B Study was conducted over a two-year period at a cost of over $1.5 million dollars in an attempt to address the complexity of the land and water resource needs, problems, and issues of the Basin. Each involved federal agency and each participating state earmarked funds for the study.

The Great Lakes Basin Commission, whose staff offices are located in Ann Arbor, Michigan, coordinated the completion of the Maumee Level B Study. The Great Lakes Basin Commission is comprised of representatives from each of the eight states whose drainage areas empty into the five lakes of the Great Lakes system. The Commission is dominated in membership by the eleven Federal agency members and one interstate compact commission. The Commission, which is supported by financial contributions from its members, was established on April 20, 1967 at the request of the member states. The Chairman of the Commission is a Federal employee appointed by the President of the United States, while the Vice-Chairman is elected by and from within the state members annually. Commissioners meet quarterly to discuss policy and program coordination matters in sessions open to the general public.

The Maumee River Basin Level B Study was requested by the states of Ohio, Indiana, and Michigan as early as 1968. Largely because of funding difficulties, the Study officially started in October 1973 following adoption of a preliminary plan by the Great Lakes Basin Commissioners in June 1973. In the four-month interim, the Water Resources Council reviewed and approved the plan of study.

The selection of the Maumee Basin for the first Level B Study in the Great Lakes Basin meant that neither the Commissioners nor the Commission staff, who would be involved in the day-to-day management and direction of the Study, were familiar with all the processes involved. The primary guidance available for water resources planning was the rather recent "Principles and Standards for Planning Water and Related Land Resources" published by the U.S. Water Resources Council in the Federal Register on September 10, 1973--only twenty days before the Maumee Level B Study began. The "Principles and Standards" represented a marked departure from past resource planning by providing guidance for systematically relating all aspects of water and related land resources planning to environmental criteria in addition to the traditional economic considerations. In addition, where appropriate, effects on regional development and social well-being were to be displayed. These new guidelines were an attempt to place environmental concerns on a basis equal to economic development. The concept was sound, but there was a lack of adequate and immediate follow-up by the drafters of the "Principles and Standards" with the resource planners around the country who desired further guidance in their application and interpretation.

Consequently, in February 1974 the State of Ohio which had the most interest in the Study of the involved states, requested that the organizational structure, the management scheme, and the direction of the Maumee Level B Study be adjusted to meet concerns that had arisen in the initial three months of the study. In the Autumn of 1973, the Water Resources Council, in an effort to provide contemporary resource planning guidance, developed a draft handbook for regional or river basin (Level B) planning. That guidance became widely known as the "New Approaches to Level B Planning" and focused upon the following concepts which became embodied in the "new approach" to the Maumee Level B Study in response to the concerns expressed by the State of

Ohio (OEPA, 1974):

(1) Strong participation role of the States;

(2) River basin commission leadership and partnership with the States;

(3) Distribution of some Federal agency funds through the basin commission to the States for input by the States;

(4) Continuous public involvement, review, and feedback at a substantial level throughout;

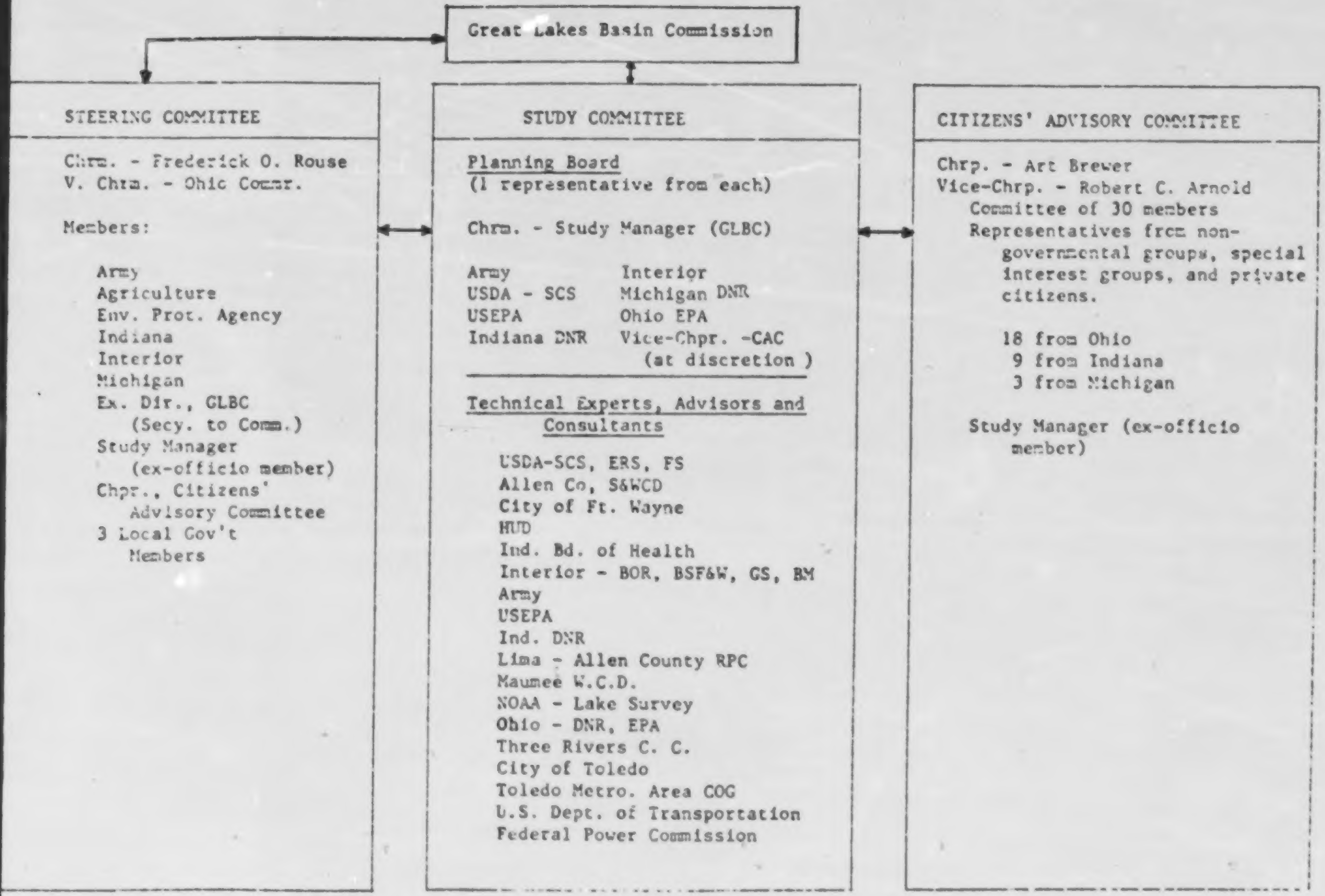
(5) Limitations on maximum funding not to exceed $2 million and maximum duration not to exceed 2 years of study so that problems are addressed in a direct and responsive manner;

(6) Exercise judgment in the planning process and limited new data collection; and

(7) Focus Study issues, problems, and solutions addressed to the year 1990 and in general terms to the year 2020.

Maumee Level B Citizen's Advisory Committee

The Maumee River Basin Level B Study about water and related land resources was formally initiated in October 1973. The management of the Study (Figure 3) was originally envisioned within the framework of a Steering Committee that would meet as necessary to decide upon policy matters, a Study Committee of resource planning "experts" that would meet regularly to provide technical input and coordination, and thirdly, a Citizens' Advisory Committee that would meet periodically to review and provide input into the activities of the Study as it progressed. The only change that was later necessary in this organizational scheme was the reduction in number of persons directly involved in the Study Committee. This "streamlining" was found to be necessary after ineffective attempts were made to conduct business through the Study Committee of 30 to 40 members who represented the numerous agencies from the


Great Lakes Basin Commission
STEERING COMMITTEE
Chrm. - Frederick O. Rouse
V. Chrm. - Ohio Commr.
Members:
Army
Agriculture
Env. Prot. Agency
Indiana
Interior
Michigan
Ex. Dir., GLBC
(Secy. to Comm.)
Study Manager
(ex-officio member)
Chpr., Citizens' Advisory Committee
3 Local Gov't Members
STUDY COMMITTEE
Planning Board
(1 representative from each)
Chrm. - Study Manager (GLBC)
Army
USDA - SCS
USEPA
Indiana DNR
Interior
Michigan DNR
Ohio EPA
Vice-Chpr. -CAC (at discretion)
Technical Experts, Advisors and Consultants
USDA-SCS, ERS, FS
Allen Co, S&WCD
City of Ft. Wayne
HUD
Ind. Bd. of Health
Interior - BOR, BSF&W, GS, BM
Army
USEPA
Ind. DNR
Lima - Allen County RPC
Maumee W.C.D.
NOAA - Lake Survey
Ohio - DNR, EPA
Three Rivers C. C.
City of Toledo
Toledo Metro. Area COG
U.S. Dept. of Transportation
Federal Power Commission
CITIZENS' ADVISORY COMMITTEE
Chrp. - Art Brewer
Vice-Chrp. - Robert C. Arnold
Committee of 30 members
Representatives from non-governmental groups, special interest groups, and private citizens.
18 from Ohio
9 from Indiana
3 from Michigan
Study Manager (ex-officio member)

SOURCE: Great Lakes Basin Commission. Maumee River Basin Level B Study: Plan of Study. MRB Series No. 1 (Ann Arbor, Michigan, 1974), p. 6.

Figure 3. Management of the Maumee River Basin Level B Study

various levels of local, regional, state, and federal government as well as the private sector. The Study Committee was then divided into two elements: Planning Board; and the technical experts, advisors, and consultants. The latter group had initially been members of the Study Committee with a continuous input. The Planning Board was comprised of a Study Manager from the Great Lakes Basin Commission; representatives from the three states of Ohio, Michigan, and Indiana; and representatives from the major federal agencies involved in the Study. The major federal agencies included the following: U.S. Army Corps of Engineers, Detroit District; Soil Conservation Service of the U.S. Department of Agriculture; U.S. Environmental Protection Agency; and the Bureau of Outdoor Recreation representing the U.S. Department of the Interior.

The other important organizational part of the Study was the Citizens' Advisory Committee. Prior to the initiation of the Study, it was agreed by the Ad Hoc Steering Committee for the Study that the three states involved in the Study would be responsible for the selection of the members for the Citizens' Advisory Committee (CAC). Representatives of these States met and agreed in August 1973 that 30 members would be an appropriate size for the CAC. Of this membership, 60 percent would be from the State of Ohio, 30 percent from the State of Indiana, and 10 percent from the State of Michigan; thus, there would be 18 representatives from Ohio, 9 from Indiana, and 3 from Michigan. The proportions of members from each of the three states was based upon the approximate land surface area of the entire Maumee River Basin that was geographically located within the borders of each of the three states.

Following approval of the Maumee River Basin Level B "Plan of Study" in June 1973, persons who had closely followed the progress and approval of the Study began to nominate either themselves or other persons whom they believed would serve well on the Citizens' Advisory Committee. Over 50 nominations of persons were received by the staff of the Great Lakes Basin Commission. These names and others nominated by the individual states were reviewed and screened by the individual states. In reviewing the names, the states attempted to secure a "balanced" representation of citizen interest on the CAC from the following public interest sectors: agriculture, government, education, industry, environmental concerns, and business. The states also considered a balance between urban and rural interests.

The selection of Ohio residents to be members of the CAC was largely done by a staff of a state agency unexperienced with the creation, selection, and operation of CAC's. That staff did not personally know any of the persons nominated for membership on the CAC, and thus attempted to select individuals upon the basis of their interest sector affiliation and their experience with planning studies and land and water resource issues and problems of the Maumee River Basin. Only after 15 of the 18 names of potential persons for the Ohio portion of the CAC had been selected, did it become subtly apparent to the selecting staff that higher management had been evaluating and approving the recommended names on bases other than those which the staff were utilizing. The 18 selected persons were notified and invited by letter from the Director of the Ohio Environmental Protection Agency to participate as a Maumee River Basin resident on the CAC for the Study.

There was unanimous acceptance by all persons invited to participate. During the extended two-year study period, however, a total of nine persons--seven of whom were Ohio CAC members--were replaced by other persons. The seven Ohio CAC replacement persons were not necessarily selected through the same process nor by the same State agency staff that had screened and selected the initial CAC members since many of the original State staff had since departed from their employer. The investigator for this research was a prime participant and the supervisor of the State agency staff that screened and selected the initial Ohio CAC members.

II. REVIEW OF THE LITERATURE

Land and Water Resource Decisions

A survey of the literature and related research germane to this research involves the exploration of two main areas. First, there was a need to examine literature that is increasingly focusing upon not only the inseparable relationships between land and water resources, but more importantly the issues of land use choices, institutional decision-making activities, and the role of the public and the government in those activities. Of the thousands of research investigations concerning water resources, there is a relatively small nucleus of related research studies that have examined the sociological dimensions. Although some of those studies have examined the attitudes of persons about water and related land resource matters, none have focused as directly upon the contemporary type land use issues as the present research. One of the related investigations has been concerned with some facet of how well a selected advisory group represented a larger general populace.

In America we are confronting the controversial, difficult, and often inflammatory problem of land resource management as never before. In 1973, the United States Department of Agriculture, Extension Service Committee on Policy, appointed a Land Use Task Force to examine the problems of land resources management with the goal of developing educational materials. Those efforts produced three land resource management educational leaflets that discussed some of the land use issues and processes and alternatives in land resource management. The heightened concern about land resource management has emerged as pressures on the land have grown and as deficiencies of uncoordinated development of land conversion have become apparent. The development of these educational materials recognized the need of citizens, government agencies, and decision makers in explaining the issues in land use, in describing instruments for shaping land use policy, and in identifying how citizens may participate more fully in those processes.

The first of the three leaflets, "Issues in Land Use" (Bonner & Sidor, 1975), began with the judicious assumption that "if constructive land use policies become reality it will be because they reflect the will of informed Americans who understand the basic questions affecting land use policy, and who are aware of possible responses to these issues when land use policy is being formulated for a given situation" (p. 1). The leaflet briefly reviewed past land use trends and then indicated three options for the use of land resources. We can continue our current "commodity- and profit-oriented" use in which we utilize land to satisfy current needs, regardless of whether such use exhausts the resource at the expense of future generations. Another option is to manage land use through conservation measures in such a way that the resource is renewed; thus, future generations have more open options when it comes their turn at making land use decisions. The third option is to preserve land by leaving it in a natural state so that future generations may decide whether to exploit, conserve, or preserve the land based upon their values and needs. The majority of this leaflet then centers upon six central issues affecting land use: "(1) the legal and economic views of land as property; (2) the significance of rural-urban relations; (3) the effects of technology on land use; (4) consumer demands, or meeting needs of land for food and fiber; (5) relations among governments--federal, state, and local--affecting policy decisions; and (6) national development trends and population distribution" (p. 1).

Since the third leaflet is closely associated with the discussion of the first leaflet, it will be presented next. The third leaflet, "Policy Instruments for Shaping Land Use Choices" (House, Quinn, Wengert & Wunderlich, 1975), described in some detail the six instruments of policy that are at work affecting land use choices. These six groups of instruments include: "(1) ownership; (2) regulation; (3) taxation; (4) subsidies and incentives; (5) investments; and (6) information, education, and persuasion" (p. 1). This leaflet postulates that "If our citizens understand the issues, the roles they may play in policy formulation, and the policy instruments available, then we must assume they will make the right decisions" (p. 12). Toward this end, the second leaflet was prepared.

The second leaflet, "The Citizen's Role in Land Use Policy" (Engel, McCord, McMurtry, Mosley & Neely, 1975), opens with the valid assumption that "If the public is to pay the cost of unwise land use decisions, it is only fair that there be mechanisms through which the public can participate in the making of land use policies and decisions" (p. 1). Theoretically, the correct land use decisions could be made by setting goals, inventorying resources, and making decisions.

But that theory does not become reality for a number of reasons including the injection of social values, economic incentives, and political influences. Knowledge of the political, social and economic conditions and the physical resources of the community is important if theory and reality are to become one. "Moreover, a comprehensive understanding of the interaction of these phenomena and how they affect attitudes and behaviors in the community is essential" (p. 2). This leaflet further contends that citizens who gather their own data and who understand the facts and ideas presented by others, are more likely to influence the remaining citizenry in support or opposition to a particular project, program, or idea. It is stated that "Participation leads to involvement and involvement leads to a better understanding of the issues. The result, of course, is a stronger and greater commitment to action and support of the decisions that follow" (p. 8).

The League of Women Voters Education Fund publication (1974) entitled "Land Use: Can We Keep Public and Private Rights in Balance?" recognized that "In the United States, a renewed concern with man's dependence on land is causing a major reappraisal of our attitudes toward it" (p. 3). That publication discusses many of the same concerns focused upon in the three previously discussed leaflets. However, the League of Women Voters publication examines in greater detail the land use problems and issues, the prevailing trends, the kinds of decisions, and who should make the land use decisions. Several issues affecting land use are included in the discussion: private rights in land vs. public interest; population growth vs. no-growth; accelerating economic growth vs. less economic growth; private choice in decisions vs. governmental intervention and regulation; urban expansion vs. rural decline and loss of prime agricultural land; monotonous, disorderly, inconvenient development vs. orderly, planned, less energy-consuming development; increasing cost of public services vs. affordable cost of public services and utilities; and wasteful consumptive patterns vs. recycling and recovery of used products into available resources. The publication elaborates upon the ramifications of who should make land use decisions. "The kinds of land use decisions ultimately made are tied to who makes, administers, and enforces the decisions" (p. 16). The advantages and disadvantages of various decision roles for each of the levels of government--federal, state, local--were explored. The publication concludes with a discussion of the citizen's role in land use decisions:

> No governmental land use program can succeed without a strong citizen role. It is the citizen who is ultimately affected by land use decisions; who elects the responsible leaders; who supports the legislation, administration, and enforcement; and who pays the bills. Because land use decisions involve weighing and balancing values, not merely making technical decisions, the citizen has a right and obligation to make his or her views known. Citizens without a direct profit interest need to be heard. (p. 27)

Population growth, economic activity, and environmental quality are inextricably a part of the land use questions that are gaining recurrent prominence in our daily lives. Recently, a New York Times Service article made front page headlines in the Columbus (Ohio) Citizen Journal. The "'Youth boom' wanes; U.S. age levels rising" (Columbus Citizen Journal, February 1977, p. 1) article opened: "Slowly, almost imperceptibly, but with inexorable force, America's population is undergoing a profound transformation that could alter nearly every facet of its way of life." The article continued discussing that the fertility rates dropped in 1976 to a new low for the fifth year in a row. "Although it is hazardous to forecast the consequences of this trend, it seems unlikely that any aspect of American life--the economy, housing styles, education, musical taste, land use [emphasis added], recreation, manufacturing, medical care, retirement practices and even politics--will emerge untouched" (p. 1).

Water Resources and Related Land Use Attitude Studies

A review of the reported research involving the attitudes held by people about water resources and related land use activities would not be complete without some discussion of attitudes, opinions, and beliefs. The distinction of these concepts from one another and their relationships to behavior will be briefly examined before reviewing related attitudinal research in water resources and land use activities.

The complexity and importance of attitude and belief systems is probably why these concepts are a focal point of social psychology. However, there does not seem to be agreement on the definitions of these conceptual terms. Milton Rokeach (1972) offers one definition:

> An attitude is a relatively enduring organization of interrelated beliefs that describe, evaluate, and advocate action with respect to an object or situation, with each belief having cognitive, affective, and behavioral components. Each of these beliefs is a predisposition that, when suitably activated, results in some preferential response toward the attitude object or situation, or toward others who take a position with respect to the attitude object or situation, or toward the maintenance or preservation of the attitude itself. Since an attitude object must always be encountered within some situation about which we also have an attitude, a minimum condition for social behavior is the activation of at least two interacting attitudes, one concerning the attitude object and the other concerning the situation. (p. 132)

Although Rokeach presents perhaps the most careful and comprehensive definition of attitude, included in this definition and central to its understanding are other related concepts for which definitions are presented merely as clarification (Rokeach, 1972):

> The content of a belief [underlining added] may describe the object of belief as true or false, correct or incorrect; evaluate it as good or bad; or advocate a certain course of action or a certain state of existence as desirable or undesirable. The first kind of belief may be called a descriptive or existential belief (I believe that the sun rises in the east.); the second kind of belief may be called an evaluative belief (I believe this ice cream is good.); the third kind may be called a prescriptive or exhortatory belief (I believe it is desirable that children should obey their parents.). (p. 113)

Various theorists (Fishbein & Ajzen, 1972; Rokeach, 1972; Shaw, 1967) combine the concepts of belief and attitude in different ways. Rokeach (1972) holds that:

> Each belief within an attitude organization is conceived to have three components: a cognitive [underlining added] component, because it represents a person's knowledge, held with varying degrees of certitude, about what is true or false, good or bad, desirable or undesirable; an affective component, because under suitable conditions the belief is capable of arousing affect of varying intensity centering around the object of belief, around other objects (individuals or groups) taking a positive or negative position with respect to the object of belief, or around the belief itself, when its validity is seriously questioned, as in an argument; and a behavioral component, because the belief, being a response predisposition of varying threshold, must lead to some action when it is suitably activated. The kind of action it leads to is dictated strictly by the content of the belief. (p. 114)

In contrast with an attitude or belief, an opinion is defined as "a verbal expression of some belief, attitude, or value" (Rokeach, 1972, p. 125). In this context, a value is an "abstract ideal, positive or negative, not tied to any specific attitude object or situation, representing a person's beliefs about ideal modes of conduct and ideal terminal goals" (p. 124).

Shaw (1967) accepts that attitudes involve affective, behavioral, and cognitive components (p. 10). While Rokeach believes that an attitude is independent of how it is learned, in comparison, Shaw defines an attitude as "a relatively enduring system of affective, evaluative reactions based upon and reflecting the evaluative concepts or beliefs which have been learned about the characteristics of a social object or class of social objects" (p. 10).

In comparison, however, Fishbein and Ajzen (1972) contend that attitudes represent the affective dimension; beliefs represent the cognitive function; and behavioral intentions represent the conation function (pp. 493-496). The difference between these two classifications may be more in terminology than in substance. "A person learns or forms beliefs about an object" and "those beliefs influence his attitude toward the object. . . . .This attitude constitutes a predisposition to respond in a generally favorable or unfavorable manner with respect to the object, just as it is related to the totality of his beliefs about the object" (Fishbein & Ajzen, 1972, p. 488). After reviewing current attitude studies, Fishbein and Ajzen concluded: ". . . the attitude area is characterized by a great deal of conceptual ambiguities. . ." (p. 531).

Harry, Gale, and Hendee (1969) examined the link between conservationists' attitudes and social structure and compared the characteristics and involvement of conservationists and nonconservationists in a large outdoor activity voluntary association in the Pacific Northwest. As hypothesized, the conservationists and nonconservationists differed on several variables. It was found that conservationists were somewhat older, more highly educated, and held higher status occupations than did nonconservationists in the general populace. Also conservationists tended to specialize in the types of associations and organizations which they joined, and within those memberships, they tended to participate more actively in the formal organization structure of those groups.

Ibsen and Ballweg (1969) investigated to what extent the public in Montgomery County (Blacksburg), Virginia perceived water as a problem, and what action the public thought should be taken to remedy such problems. Some of the significant findings of that study included: males were more aware of both water resource problems and possible solutions than were females; the younger, more highly educated and higher income persons were cognizant of both water resource problems and potential solutions; and television was reported as the most common source of communications media about water resource problems.

During the 1960's and early 1970's, Americans in general became increasingly aware of environmental quality issues and problems that had been present but dormantly unnoticed for decades. Buttel and Flinn (1969) conducted statewide surveys in Wisconsin in 1968, 1969, and 1970 to discover what type of persons expressed concern about the environmental issues and problems and why those persons were concerned. The research investigated the relationships between the socio-economic characteristics (education, income, occupation, place of residence, and political identification) and environmental concern. Research findings supported earlier research findings (Hendee, 1968) that urban oriented persons holding occupations not involving direct exploitation of the natural environment were more likely to perceive environmental problems and subsequently support environmental movements. Buttel and Flinn discovered: "The rural farm grouping tended in both years to be much less concerned with environmental problems than did rural nonfarm and urban aggregates" (pp. 64-65). The research findings corroborated the findings of other earlier studies in that political identification had no direct association with concern with pollution. However, the findings did reveal that low educational level Democrats, who typically are the semi- or unskilled workers that depend upon the manufacturing processes, were less concerned with pollution than Republicans or Independents. But, the high education Democrats were more likely to support the environmental movement than were either Republicans or Independents of the same educational level.

Andrews and Geersten (1970), in a case study of the Bear River Basin, in southeastern Idaho and northern Utah, examined the attitudes of residents toward basic land use and water resource issues relevant to that Basin. The residents were categorized into three types of residence and two general occupational categories: open country farm, open country non-farm, town farm, town non-farm, and metropolitan-urban. Although some interview questions concerned the influence of mass media upon attitude formation and such issues as public interest versus private property rights, generally the study was geographical and project specific. Chapter 7 of the reported research, concerned with attitudes toward institutions and social systems, provided helpful insight.

The usefulness of a Likert-type scale was demonstrated (Lee, 1973) in a Level A Study (more comprehensive and precedes a Level B) for the Lower Mississippi River Region. The scale was utilized to provide public involvement and input into the water resources planning process. Lee used a Likert type scale to measure public attitudes on water resource related subjects in an attempt to determine public preferences regarding goals and objectives for the Lower Mississippi Region Comprehensive Study.

Kaynor and Howards (1973) examined attitudes, values, and perceptions in water resources decision-making within a metropolitan area in the Connecticut River Basin. Their study focused upon the following primary interest areas: (1) fragmentation of jurisdictional authority at the local metropolitan level; (2) apathy of the public in providing input to technical water resource decision-makers; (3) relationship between the public's opinions which are based upon value differences and their knowledge about the facts; and (4) the inter water resource interest group conflicts arising where such groups pursue their interests. That research indicated that fragmentation of local governmental jurisdictions is probably the most important factor constraining optimum regional water resources decision-making. While fragmentation was the principal deterrent to optimization of water resources decision-making, apathy and distorted perceptions were also influencing factors; inter-group conflict was not found to be a significant factor. Another pertinent finding was that "attitudes, values, and perceptions with respect to water resource plans and programs are affected by personal and community background characteristics" (p. 98).

McPartland (1973), in a study of the northern portion of the Big Blue River Basin in southeast Nebraska, examined demographic variables and attitudes toward water conservation. Specifically, he (1) determined what demographic variables seem related to the people's attitudes toward water conservation, (2) discovered public attitudes toward various issues concerned with water conservation, and (3) tested and compared methods of communicating knowledge about water conservation problems. He found that support for water conservation was greatest among the people who lived in urban areas, who had the most formal education, and who were under 55 years of age; the least support came from people who were directly involved in farming, the oldest age group, and the least educated. Education had a positive relationship with attitudes, whereas age, income, and other variables seemed to make little difference in rural attitudes.

The only related research study that could be found concerning the "representativeness" of public involvement in water resources decision-making was completed by Pierce and Doerksen (1975) and published following the initiation of this research investigation concerning the Maumee River Basin. That research project conducted in the state of Washington had several specific objectives related to this research. Among the research objectives examined in the Washington study that are related to the Maumee research study are the following: (1) assessment of the attitudes of the general public, citizen advisory committee members, interest groups, and agencies toward citizen involvement; (2) evaluation of the degree to which one public participation mechanism--the citizen advisory committee--is representative of the public;

and (3) determination of the extent to which reported methods of selection of citizen advisory committee members influenced Citizen's Advisory Committee (CAC) representativeness. That research study solicited responses from the sampled general public and the respective CAC's in five river basins through mail questionnaires. The study examined representativeness in terms of both social characteristics and attitudinal responses displayed between the river basin public and the CAC for each area. The attitudes of water resource administrators about the need for public participation, the benefits and consequences of participation, and the appropriate mechanisms to achieve participation were examined.

The general public, CAC members, and interest group leaders, as compared with water managers from various intrastate governmental levels, believed that it was important for the public to be involved in water resource decisions. Overall, the general public's preferences about water resource matters were more frequently matched by those of the CAC members than by either the interest group leaders or the water managers.

III. METHODOLOGY

Population and Sample

The degree to which the Citizens' Advisory Committee (CAC) represent the general public in the Maumee River Basin Level B Study was measured by comparison of questionnaire responses received from the sampled general public and from previous and current members of the CAC. A census of the CAC was chosen as compared with a probability sample selected from the general public.

The CAC was initially established and maintained at a maximum size of 30 members; however, during the Study, nine members resigned and were replaced. All 39 of those persons were included in the census of the CAC. Only 3 of the 30 final active CAC members did not respond, while five of the original nine CAC members who had resigned and had been replaced during the Study did not respond.

The universe of the general public was defined as the persons 18 years of age or older living in the northwestern Ohio 14 counties which have all or a large portion of their drainage area contained within the Maumee River Basin. In 1975, according to the United States Department of Agriculture, Economic Research Service projections (GLBC, 1976b, p. 2-7), nearly 1.17 million persons lived in this geographic area. From this defined universe, a random sample of the names and mailing addresses of 560 persons was selected by The Ohio State University

Survey Research Laboratory from the 1975 telephone directories for the study area.

This systematic random selection was accomplished by first determining the total number of persons with telephone numbers listed in those nearly 80 telephone directories. Then by the use of a table of random numbers, the specific starting entry was selected. The total number of telephone entries divided by the 560 desired sample size yielded the interval utilized to select subsequent entries.

The sample size of 560 names was compiled to allow 60 names for the field testing (trial run) of the questionnaire instrument. The sample size of 500 was chosen to provide filler names for the anticipated 20 percent of the population involved in a change of residence each year; thus, the initially desired sample size was 400 persons.

The initial sample size of 400 persons was calculated using the following formula for estimation of sample size (Warmbrod, 1973):

$$n_o = \frac{t^2\ p\ q}{d^2} = \frac{(2.0)^2\ (.50)\ (.50)}{(.05)^2} = 400$$

In estimating sample size to be used considering limitations, the symbols in this formula represent the following:

1. n_o = desired sample size;
2. "t" represents the table value when the researcher is willing to take a risk of 1 in 20 (95 percent confidence interval) that the actual error may exceed the acceptable margin of error;
3. "d" represents the acceptable margin of error; and
4. "p" and "q" represent the variance in the population (p = .50 and q = .50 represents the maximum variance that can be expected).

A misconception held by some non-researchers is that sample size is directly related to the size of the population to be sampled. While the calculation of sample size follows a formula, careful judgments must be exercised in the selection of values that are entered into the formula. The primary considerations that influenced the determination of sample size were of both statistical and pragmatic nature. Those considerations are as follows:

1. variance (on the variables of interest) in the population;
2. margin of error acceptable, that is, willingness to accept an estimate that is within 5 percent of the actual percentage;
3. risk that is inherent that the actual error should exceed the desired margin of error, that is, the alpha level;
4. alpha level utilized and found acceptable in similar research; and
5. monetary, manpower, and time resources available.

The 1970 U.S. Bureau of the Census statistics for the study are of 14 counties in northwestern Ohio were examined, but no specific conclusions were derived that could readily help determine the needed sample size.

Provided that the telephone directory listings represented a cross-section of all sectors of the public, then the random sample of the listed names and the telephone numbers provided a representative sample of the general public within the Maumee River Basin. Cognizant of this assumption, the findings could then be generalized to the universe of the Basin's general public. Non-response error was examined by conducting telephone follow-up interviews with a random sample of non-respondents and comparing their responses with those of the initial respondents.

Design

The survey design in this study utilized a mail questionnaire sent to the sample of residents with the purpose of collecting their responses from which inferences could be made to the general populace of the Maumee River Basin. This research study included the development, pretesting, revision, coding, and mailing of a questionnaire to all potential respondents. The results were collected, coded, analyzed, interpreted, and reported.

Responses from the sampled members of the general public and from the Citizens' Advisory Committee members were solicited through a series of three consecutive mailings. Each mailing contained both a letter and a copy of the questionnaire. The first mailing of questionnaires was sent in early August 1976 with each succeeding wave sent 21 calendar days apart. Persons who responded were not sent a subsequent wave.

The original sample of the general public contained 500 potential respondents, which included 100 names above the desired sample size of 400. These 100 names were to be utilized as replacements for questionnaires that were undeliverable, but only 44 questionnaires were returned undeliverable or uncompleted because the respondent was deceased, aged, infirmed, or did not care to answer. Of the remaining 456 in the sample, 200 persons completed and returned the questionnaires for a response rate of 44 percent.

The 39 persons who were presently or had at some previous time been members of the Citizens' Advisory Committee each received the questionnaire. All questionnaires were deliverable on the first wave of mailings. Of the 39 potential CAC respondents, only a total of 8 persons did not respond yielding a total return rate of nearly 80 percent. The response rate of currently active CAC members was even higher with 90 percent of those 30 persons responding.

The 80 to 90 percent response rate for the CAC members was not surprising since the CAC is a collectively identifiable group of persons who should be more knowledgeable about land and water resources matters than the general public (this is not to say that the attitudes of the CAC members are alike or similar to the attitudes held by the general public). The response rate of 44 percent from the sampled general public was, however, high in comparison with generally low response rates to mail questionnaires (Kerlinger, 1973). Return rates of less than 40 percent are common with higher percentages a rarity.

The mail questionnaire was the survey method selected because of its adaptability for use by governmental institutions and because of its relative inexpensiveness as compared with alternative survey methods. The lack of sufficiently high response rates and the inability to check given responses are two defects that are possible in the use of mail questionnaires unless it is used in conjunction with other techniques (Kerlinger, 1973). The personalization of letters to sampled persons, the provision of an incentive, interviewing a random sample of non-respondents, and analysis of data eventually obtained from the sampled non-respondent sector were all means utilized in this study to secure a larger return rate and to reduce non-sampling error.

Instrumentation

The instrument development phase of the research included several identifiable but interrelated processes:

1. selection of an appropriate measurement scale;
2. development of a set of items to measure attitudinal variables of interest;
3. preparation of items to measure the socio-economic variables of interest;
4. selection and editing of questionnaire statements;
5. format layout and design; and
6. consideration of validity and reliability characteristics.

Any data-gathering technique is more appropriate in certain research designs and not in others. Likewise, some scales of measurement are more appropriate to certain types of research than are others. A review of the literature (Oppenheim, 1966) concerning the construction of scales of measurement indicates that there have been few major advancements since the Thurstone and Likert methods were developed. Attitude measurement tools used in water resources research have varied: Q-sorts, Likert and Thurstone scales, and the Guttman technique. Among the several approaches to the measurement of attitudes contained in the literature, the two that remain used most often are the Thurstone and the Likert scales. The usefulness of the Likert scale in water resources related research has been demonstrated (York, 1969; Lee, 1973; Ertel, 1974).

The Likert-type scale was selected for use in this research concerning public involvement in land and water resource matters for several reasons. The relative ease of constructing a Likert-type scale adhered to one of the implied doctrines of this research, that is, the methodology, the instrument development process, and perhaps even the instrument should be adaptable and usable by other than professional researchers. This utility is necessary if governmental agencies interested in determining the "representativeness" of public involvement in a particular land and water resources program are to be afforded such capability through the products of this research. Caution should be exercised, however, in behavioral research of this nature to mention that rating scales of this type have also been misused by untrained persons. The Likert-type scale has virtues that make it a valuable tool in this type of research: requires less time than other methods; generally interesting and easy for observers to use; has a wide range of application; and can be used with a large number of characteristics (Kerlinger, 1973). The Likert-type scale not only provides precise information about a respondent's degree of agreement or disagreement, it also enables exploration of the subtler and deeper facets of an attitude. This scale, unlike the Thurstone method, allows a range of responses that could provide more information on a given item (Selltiz, 1959).

The Likert-type scale was constructed through the development and compilation of a number of statements thought to pertain to an attitude in question. There are five possible responses to each item, ranging from strongly agree (SA), thorough agree (A), undecided (U), and disagree (DA), to strongly disagree (SD). The five categories are scored by assigning values of 5, 4, 3, 2, and 1, respectively. The undecided (U) response was coded as a value of 3, but it was placed as the last choice in the listing of the choices (SA, A, D, SD, U) in an attempt to reduce any central tendency error resulting from persons who, unfamiliar with the subject content, might tend to rate each item down the middle of the rating scale (Kerlinger, 1973). A strongly agree response to a positive statement was scored as 5, while a strongly disagree response was scored as 1. In contrast, a strongly agree response to a negative statement received a value of 1 and a strongly disagree received a value of 5. An individual's total score represents the summation of ratings for all items answered.

Initially, a large number of various statements of opinion were developed and collected concerning land and water resources and the role of the government and the citizen in land and water resource management matters. From this array of statements, a number of statements were selected and edited according to the following criteria (Edwards, 1957):

1. statement should contain only one thought;
2. statement language should be simple and clear;
3. statement should be short, rarely exceeding 20 words;
4. statement should not contain ambiguous words;
5. statement should not be factual; and
6. statement should not be capable of being interpreted in more than one way.

A total of 12 statements were finally selected following discussions with peers, professionals, and pre-testing to solicit attitudinal responses concerning land and water as resources. Through the same procedures, a total of 13 statements were used to collect responses concerning the involvement of the public and the government in land use matters. These statements were placed on the first and third pages of the questionnaire, respectively.

Since the researcher could not find an appropriate existing scale to measure the effectiveness of governmental institutions (agencies) as perceived by the respondents, one was developed. This scale was placed on the second page of the questionnaire in an attempt to provide a change of pace at that point for the respondent. A modified Likert-type scale was adapted through the listing of generic names and names of governmental leaders and agencies at various levels of government. There are three possible responses to each name ranging from very well, through fair/average, to poorly. The respondent selected the response that best expressed his or her feeling about how well each of the persons or groups is dealing with land and water resources matters. The respondent was also offered the optional choices of checking one of two other response categories provided. If a respondent had not heard about the person or group named, or either had not known or formed an opinion then he or she could check one of the respective categories rather than one of the affective type responses.

The last page of the questionnaire contained questions concerning demographic socio-economic variables about the respondent. The respondent was asked to check one of the categories provided in each item, or in the case where none of the categories apply, then the respondent was provided with an open-ended category for writing in an appropriate response; the latter was rarely used. The socio-economic variables were selected for several reasons:

1. these variables provide a descriptive profile of the demographic characteristics of the respondents;
2. related research has shown a relationship between these variables and the types of attitudinal responses that can be expected; and
3. these variables are compatible with the U.S. Bureau of the Census demographic variables should comparison be desired.

When measuring simple attributes or physical characteristics of persons or objects, validity is not a great problem (Kerlinger, 1973, p. 456). In behavioral research, however, where objects are not always so easily measured, validity often becomes quite an important question. A distinction should be made between validity and reliability. Validity is concerned with the question: Is the item measuring what we want it to measure?

Kerlinger (1973) indicates that ". . .there is no one validity. A test of scale is valid for the scientific or practical purpose of its user" (p. 457). The validation of attitude measurement scales is one of the most difficult demands of behavioral research (Shaw, 1967, p. 562). Three types of validity have been commonly accepted: content, criterion-related, and construct. Content validity is concerned with the sampling adequacy of the content of the questionnaire, that is, did the attitudinal statements measure the desired domain of aspects associated with the referent object? "Content validation consists essentially of judgment" (Kerlinger, 1973, p. 458). Questions at polar ends of the domain spectrum were deliberately designed in some instances to verify the validity of responses. Criterion-related, or concurrent, validity is concerned with predictive ability associated with practical problems, while construct validity is concerned with theoretical constructs and empirical inquiry.

Reliability addresses the question: If the same subjects or referent objects are repeatedly measured with the same or comparable measurement instrument will the same or similar results be obtained (Kerlinger, 1973)? Several measures were taken to improve reliability in the design and layout of the mail questionnaire used in this research investigation. In this effort an attempt was made: (1) to write clear and simple directions complete with examples; (2) to write unambiguous statements and questions; and (3) to provide an adequate number and comparable quality of statements.

An internal analysis of each of the three Likert-scaled sections of the questionnaire yielded three Kudder-Richardson (KR) Scale Reliability Coefficients (Johnson and McCabe, 1975). While a KR reliability coefficient can range from zero to an absolute value of 1.0, a reliability of .3 or higher is acceptable. For the first, second and third sections, the KR values were (rounded) 0.37, 0.91, and 0.41, respectively.

Data Collection

The mail questionnaire was designed to provide a demographic profile of respondent's personal characteristics and their attitudes toward land and water resources, the governmental institutions (agencies) making decisions concerning those resources, and the role of government and the citizen in those decisions. The review of related literature produced only a relatively few water resources studies involving social variables and provided less than a half dozen instruments of any kind in this subject area. Although reports of research in this subject area were obtained from various geographical locations across the United States, including especially the water resources research centers at state land grant colleges, very few such experts contained the survey instrument utilized to collect data. Subsequent attempts to locate the investigator and to request a copy of the instrument met with only minimal success. In the successful instances, the instrument was not appropriate for use in this study. Most instruments received were either of the open-ended type used mainly in personal interview situations or were designed so specifically for an individual river basin that only the most general of ideas or concepts were of any assistance.

A four section, monarch-sized (7" x 8½" folded once) questionnaire printed with blue ink on white paper was the style questionnaire decided upon following review of literature related to the style (Erdos, 1971) and after consultation with expert graphic consultants. The three different letters that accompanied each questionnaire on the respective three waves of mailing were printed in black ink with a blue ink signature on the stationery of The Ohio State University Water Resources (Research) Center. Imprinted envelopes of the Center were also utilized for transmittal to the recipient, but the enclosed, self-addressed, stamped envelope was plain bond. In an attempt to increase response, each outside envelope was hand-addressed and a postage stamp was affixed to each.

Together with the personalization of letters to potential respondents, an incentive was offered in an attempt to increase the rate of return. Each person was given the opportunity to choose one of four named and nationally known charities to which one dollar ($1.00) would be sent upon completion and return of their questionnaire. The use of this type of incentive is apparently not widespread since it was not mentioned in any literature pertaining to the subject of mail surveys. The charitable contribution idea was an incentive employed by the Columbus, Ohio newspapers (Citizen-Journal and Dispatch) to encourage discontinued customers to respond and explain the reasons for their discontinued subscriptions. The lack of empirical evidence as to the success of this type incentive indicated that it should be compared with other types of incentives; this comparison was designed into the pilot field testing phase of the research. Despite this lack of empirical evidence, at the outset the charitable contribution incentive seemed to have several merits worthy of consideration:

1. Money seems to be the most effective and least biasing incentive since it is equally desirable to all members of a sample (Erdos, 1971).
2. A contribution donated to a charity, the choice of which would be the discretion of the respondent, could be closely associated with the concept of a strict monetary incentive.

3. The use of the charitable donation incentive would preclude the necessity of sending each respondent a monetary reward by return mail--a costly, time-consuming, and risky activity.

A pilot study phase preceded the actual solicitation of responses from the 500 randomly selected members of the general populace and the 39 members of the Citizens' Advisory Committee. This pilot phase consisted of two parts: a pre-testing and a field testing. The pre-testing validation began with the personal distribution of the questionnaire to associates, friends, and community residents who knew the researcher. Without any explanation about the items on the questionnaire, these persons were asked and agreed to complete the questionnaire. After about one week, personal interviews were arranged between the researcher and the respondents to discuss each item on the questionnaire. The discussions focused upon such aspects as the interpretation, wording, format, and sequential order of items on the questionnaire. Those persons were quite helpful in recommending modifications, changes in choice of words, and items that should be included or deleted. Those revisions were incorporated in the reprinted questionnaire.

The second part of the pilot study phase, the actual field testing, involved distribution of the revised questionnaire and a cover letter to 60 randomly selected members of the general public; these 60 were selected from the original 560 randomly selected residents of the Maumee River Basin counties. This actual field testing was accomplished for two primary reasons. First, the occurrence of bias resulting from misunderstanding of statements or directions and difficult wording were checked. Secondly, the effectiveness of three different incentive types was examined. The 60 names were randomly divided into three incentive groups with each receiving one of the three incentive types:

1. a 1976 Bicentennial half-dollar by return mail upon receipt of the completed questionnaire;
2. one-dollar by return mail upon receipt of the completed questionnaire; and
3. a one-dollar contribution to charity upon receipt of the completed questionnaire.

The incentive types that either promised a one-dollar bill or a one-dollar contribution to a selected charity were more effective in encouraging persons to complete and return the questionnaires. The one-dollar contribution to charity was 50 percent more effective incentive than the direct promise of one dollar. The slightly better effectiveness, the need for empirical evidence, and the ease with which this incentive type could be utilized were all reasons that led to the use of the one-dollar to charity incentive.

The personalization of letters to respondents and the provision of the incentive usually help increase the rate of return; however, there will almost always be a sector of non-respondents. A random sample of non-respondents was selected and interviewed in an effort to ascertain bias that might be introduced through this source. The non-respondents were telephoned and asked only selected items from the questionnaire rather than all items. This strategy was utilized since it was likely that persons who had not responded after receiving three letters and questionnaires would not desire to answer all the items during a telephone conversation. Therefore, the researcher decided that it would be most useful to receive answers to all selected items by all interviewed non-respondents. While a random sample of 50 non-respondents was selected, only 26 could be contacted by telephone. Of the 26, only 1 person refused to complete the telephone interview. Of the 24 non-respondents that could not be contacted by telephone, as with the 26 if necessary, each was called twice. The initial telephone call was usually made during the day, while the second telephone call was always made in the evening hours. Each telephone call was allowed to ring ten times. Answers received from the 26-non-respondents are compared with those received from the general public in the Findings section.

Data Analysis

The data from the mail questionnaire were coded and punched onto a single computer card. All data were analyzed through the Instructional and Research Computer Center at The Ohio State University utilizing the Statistical Package for Social Sciences (Nie, et al., 1975) A sample of the punched cards was hand verified.

The principal statistical procedures used in analyzing the attitudinal and demographic data was the chi-square statistic. The Students t-test was utilized to compare summated responses between the two sectors. The nonparametric chi-square statistic yields a value which represents the disparity between actual and observed frequencies falling into each data category. As there is greater disparity the chi-square value increases until it becomes statistically significant. The parametric and robust t-test yields an index of the significance of the differences between means of two sampled groups. The t value increases as the means are significantly different.

An alpha level of .05 was used in all situations. Although many researchers would perhaps prefer the alpha = .01 level of significance because of its high almost "practical certainty" (Kerlinger, 1973), the selection of that level versus the alpha level of .05 is dependent upon several considerations, not the least of which include the practical limitations of money, manpower, and time available to achieve such a high degree of precision. The .05 level means that an obtained result that is significant at the .05 level could probably (by chance) occur about 5 times in 100; this level has been quite acceptable in research similar to this investigation.

The .05 level was originally chosen (Fisher, 1950) and has persisted with researchers because "it is neither too high nor too low for most social scientific research." Other researchers (Skipper, et al., 1967) suggest that rather than "blind adherence" to reporting a relationship between data as significant or not significant, the actual probability level should be stated. In this study, that procedure was followed.

IV. FINDINGS

The bases for comparison of the Citizen's Advisory Committee (CAC) with the general public of the Maumee River Basin were attitudinal responses and demographic characteristics. The attitudinal responses focused upon the following three related, but distinctly identifiable, subject areas concerning land and water resources: land and water as natural resources, the effectiveness of governmental institutions making land and water resource decisions, and the role of the government and the citizen in making land and water resource decisions. Demographic characteristics on which these two groups were compared included occupation, education, age, income, place of residence, and political affiliation. Operationally, the focus of representativeness means the extent to which the CAC and the general public responded in a similar manner and the extent to which they were similar in demographic characteristics.

Respondents and Non-respondents

Before presenting responses and characteristics of the CAC and the public, the public respondents were compared with the public non-respondents to ensure that the public respondents were not atypical of the randomly sampled general public. The respondents and non-respondents of the general public were compared on twenty-four items, including six demographic characteristics, out of the total fifty-three items contained on the questionnaire.

The respondent and non-respondent groups were compared on four statements concerning land and water as resources. The groups generally agreed (Table 1) that land and water were basic natural resources. They were concerned (Table 1) that the economic use of land should not preempt the need to improve the quality of the environment. The two groups were divided (Table 2) upon whether land should be considered a private resource. However, over two-thirds of the respondents agreed that land should be a national resource, while one-half of the non-respondents disagreed and only [illegible] percent agreed (Table 2).

The most notable contrast between the respondents and non-respondents was in their evaluations about the effectiveness of governmental institutions in making land and water resource decisions. The two groups differed significantly in their evaluations of the effectiveness of six out of nine institutions. The two groups did not differ in their evaluations of the United States Soil Conservation Service (Table 3), the County Cooperative Extension Service (Table 4), and the local township trustees (Table 4).

The non-respondents were not as well informed as the respondents on each of the nine institutions. Both groups were best informed about the United States Congress and the least informed about the Great Lakes Basin Commission (Table 3).

Although both groups were best informed about the United States Congress, they also believed that the United States Congress had been the least effective of all nine institutions (Table 3). The Ohio Department of Natural Resources, followed by the Ohio Environmental

TABLE 1

RESPONDENT AND NON-RESPONDENT PERSPECTIVE ON LAND AS A RESOURCE AND ITS RELATIVE IMPORTANCE

Response	Land and Water are Basic Resources				Economic Development Over Environmental Quality			
	Resp.		Non-resp.		Resp.		Non-resp.	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Strongly Agree/Agree	196	99.5	23	100.0	43	22.2	8	34.8
Undecided	0	0.0	0	0.0	27	13.9	4	17.4
Strongly Disagree/ Disagree	1	0.5	0	0.0	124	63.9	11	47.8
TOTAL	197	100.0	23	100.0	194	100.0	23	100.0

Chi square = 1.68
df = 1
p = 0.19

Chi square = 2.42
df = 2
p = 0.30

TABLE 2

RESPONDENT AND NON-RESPONDENT PERSPECTIVE ON LAND RESOURCE MANAGEMENT

	Land Should be a Private Resource				Land Should be a National Resource			
	Resp.		Non-resp.		Resp.		Non-resp.	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Strongly Agree/Agree	75	38.5	10	45.5	134	68.7	6	30.0
Undecided	19	9.7	0	0.0	19	9.7	4	20.0
Strongly Disagree/ Disagree	101	51.8	12	54.5	42	21.5	10	50.0
TOTAL	195	100.0	22	100.0	195	100.0	20	100.0

Chi square = 2.42
df = 2
p = 0.30

Chi square = 12.04
df = 2
p = 0.002

TABLE 3

RESPONDENT AND NON-RESPONDENT EVALUATION OF THE EFFECTIVENESS OF FEDERAL AND INTERSTATE GOVERNMENTAL INSTITUTIONS

Response	United States Congress				Soil Conservation Service				Great Lakes Basin Comm.			
	Resp.		Non-resp.		Resp.		Non-resp.		Resp.		Non-resp.	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Very Well	5	2.6	1	4.3	32	16.8	2	8.7	16	8.5	1	4.3
Fair/Average	78	41.1	4	17.4	85	44.7	9	39.1	56	29.8	1	4.3
Poorly	74	38.9	7	30.4	15	7.9	1	4.3	15	8.0	0	0.0
Don't Know	33	17.4	11	47.8	58	30.5	11	47.8	101	53.7	21	91.3
TOTAL	190	100.0	23	100.0	190	100.0	23	100.0	188	100.0	23	100.0

	United States Congress	Soil Conservation Service	Great Lakes Basin Comm.
Chi square	12.80	3.24	12.19
df	3	3	3
p	0.01	0.36	0.01

TABLE 4

RESPONDENT AND NON-RESPONDENT EVALUATION OF THE EFFECTIVENESS OF LOCAL AND COUNTY-WIDE GOVERNMENTAL INSTITUTIONS

Response	Township Trustees				Soil and Water Conservation District				County Cooperative Extension Service			
	Resp.		Non-resp.		Resp.		Non-resp.		Resp.		Non-resp.	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Very Well	9	4.9	1	4.3	13	6.9	4	17.4	19	10.3	2	8.7
Fair/Average	59	32.1	8	34.8	86	45.7	5	21.7	63	34.1	4	17.4
Poorly	57	31.0	3	13.0	28	14.9	1	4.3	18	9.7	1	4.3
Don't Know	59	32.1	11	47.8	61	32.4	13	56.5	85	45.9	16	69.6
TOTAL	184	100.0	23	100.0	188	100.0	23	100.0	185	100.0	23	100.0
	Chi square = 3.83 df = 3 p = 0.28				Chi square = 10.57 df = 3 p = 0.01				Chi square = 4.81 df = 3 p = 0.19			

Protection Agency, were evaluated (Table 5) by both groups as the most effective of all nine institutions.

Neither the respondents nor the non-respondents thought (Table 6) that people were comfortable about elected officials making land use decisions. However, both groups agreed that land use decisions should be entrusted to knowledgeable citizens selected to represent the public on those matters. Furthermore, both groups believed that local people should have the most say (Table 7) in land use decisions.

The non-respondents and the respondents were compared on the following six demographic characteristics: occupation, education, age, income, place of residence, and political affiliation. The two groups were different on occupation and income (Table 8) with the respondents having a larger percentage of professional and technical persons and higher incomes. The two groups did not differ on education, age, place of residence (Table 9), or political affiliation.

In summary, the non-respondents and respondents from the sampled general public of the Maumee River Basin study area responded similarly on nearly two-thirds of the items compared (Table 10) in three out of four of the subject areas examined. The two groups could be considered alike in their aggregated responses, and consequently the samples respondents could be considered representative of the general public. It should be remembered, however, that the respondents were not representive of the public in evaluation of the effectiveness of governmental institutions because the respondents were better informed and the two groups were evenly divided in the number of similar and dissimilar demographic characteristics.

TABLE 5

RESPONDENT AND NON-RESPONDENT EVALUATION OF THE EFFECTIVENESS OF OHIO LEGISLATURE AND EXECUTIVE AGENCIES

Response	Ohio Legislature				Ohio Department of Natural Resources				Ohio Environmental Protection Agency			
	Resp.		Non-resp.		Resp.		Non-resp.		Resp.		Non-resp.	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Very Well	0	1.6	0	0.0	41	21.6	5	22.7	25	13.5	4	20.0
Fair/Average	78	41.1	3	13.0	95	50.0	3	13.6	80	43.2	4	20.0
Poorly	69	36.3	2	8.7	12	6.3	1	4.5	27	14.6	0	0.0
Don't Know	40	21.1	18	78.3	42	22.1	13	59.1	53	28.6	12	60.0
TOTAL	190	100.0	23	100.0	190	100.0	22	100.0	185	100.0	20	100.0
	Chi square = 33.95 df = 3 p = 0.001				Chi square = 16.15 df = 3 p = 0.001				Chi square = 11.43 df = 3 p = 0.02			

TABLE 6

RESPONDENT AND NON-RESPONDENT PERSPECTIVES ON BEING REPRESENTED IN LAND USE DECISIONS

Response	People Feel Comfortable About Elected Officials in Land Use Matters				Leave Decisions to Selected Citizens			
	Resp.		Non-resp.		Resp.		Non-resp.	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Strongly Agree/Agree	34	17.3	5	21.7	146	74.9	17	73.9
Undecided	32	16.2	8	34.8	20	10.3	4	17.4
Strongly Disagree/ Disagree	131	66.5	10	43.5	29	14.9	2	8.7
TOTAL	197	100.0	23	100.0	195	100 0	23	100.0

Chi square = 5.83
df = 2
p = 0.054

Chi square = 1.51
df = 2
p = 0.47

TABLE 7

RESPONDENT AND NON-RESPONDENT PERSPECTIVES ON THE LEVEL OF GOVERNMENT FOR LAND USE DECISIONS

Response	Local Should Have More Say Than State				Federal Should Have More Say Than State				Decisions Should be Regionally Oriented			
	Resp.		Non-resp.		Resp.		Non-resp.		Resp.		Non-resp.	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Strongly Agree/Agree	155	79.5	17	73.9	25	12.8	2	8.7	143	72.6	14	60.9
Undecided	20	10.3	5	21.7	28	14.4	2	8.7	31	15.7	7	30.4
Strongly Disagree/ Disagree	20	10.3	1	4.3	142	72.8	19	82.6	23	11.7	2	8.7
TOTAL	195	100.0	23	100.0	195	100.0	23	100.0	197	100.0	23	100.0

Local Should Have More Say Than State	Federal Should Have More Say Than State	Decisions Should be Regionally Oriented
Chi square = 3.19 df = 2 p = 0.21	Chi square = 1.03 df = 2 p = 0.60	Chi square = 3.13 df = 2 p = 0.21

TABLE 8

RESPONDENT AND NON-RESPONDENT DEMOGRAPHIC CHARACTERISTICS

Demographic Characteristics	Respondents		Non-respondents	
	No.	Pct.	No.	Pct.
OCCUPATION (Chi square = 19.93, p = 0.003)				
Skilled, semi- & unskilled worker	63	33.2	3	13.0
Professional & Technical	56	29.5	4	17.4
Clerical & Sales	15	7.9	2	8.7
Proprietor & Manager	18	9.5	1	4.3
Farmer & Farm Worker	4	2.1	1	4.3
Service Worker	5	2.6	0	0.0
Other (examples: retired, housewife)	29	15.3	12	52.2
TOTAL	190	100.0	23	100.0
EDUCATION (Chi square = 10.14, p = 0.07)				
1 - 8 years	10	5.0	3	13.0
9 - 11 years	19	9.5	1	4.3
12 (High School Graduate)	80	40.0	9	39.1
1 - 3 years of college	30	15.0	7	30.4
4 years (College Graduate)	24	12.0	3	13.0
Over 4 years of college	37	18.5	0	0.0
TOTAL	200	100.0	23	100.0
AGE (Chi square = 7.69, p = 0.36)				
Under 19	1	0.5	0	0.0
20 - 24	10	5.0	4	17.4
25 - 29	25	12.5	1	4.3
30 - 39	36	18.0	4	17.4
40 - 49	36	18.0	5	21.7
50 - 59	35	17.5	3	13.0
60 - 64	21	10.5	1	4.3
65 or Over	36	18.0	5	21.7
TOTAL	200	100.0	23	100.0
INCOME (Chi square = 12.63, p = 0.03)				
Under $5,999	11	6.0	5	25.0
$6,000 - $9,999	21	11.5	1	5.0
$10,000 - $14,999	51	27.9	8	40.0
$15,000 - $24,999	68	37.2	3	15.0
$25,000 - $49,999	25	13.7	2	10.0
$50,000 or Over	7	3.8	1	5.0
TOTAL	183	100.0	20	100.0

TABLE 9

RESPONDENT AND NON-RESPONDENT DEMOGRAPHIC CHARACTERISTICS

Demographic Characteristics	Respondents		Non-respondents	
	No.	Pct.	No.	Pct.
RESIDENCE (Chi square = 0.56, p = 0.75)				
Rural Farm	17	8.7	1	4.5
Urban (city or town)	133	68.2	15	68.2
Rural Non-farm	45	23.1	6	27.3
TOTAL	195	100.0	22	100.0
POLITICAL AFFILIATION (Chi square = 0.24, p = 0.89)				
Democrat	79	42.7	9	40.9
Independent	56	30.3	6	27.3
Republican	50	27.0	7	31.8
TOTAL	185	100.0	22	100.0

TABLE 10

SUMMARY OF COMPARISON OF RESPONDENTS AND NON-RESPONDENTS OF THE GENERAL PUBLIC SAMPLE

Questionnaire Subject Areas Used in the Comparison	Number of Items Used in Comparison	Number of Items Displaying Response Differences	Percentage of Items Displaying Response Differences
Land and Water as Natural Resources	4	1	25
Governmental Institution Effectiveness	9	6	67
Government and Citizen Roles in Land Resource Decisions	5	0	--
Demographic Characteristics	6	2	33
TOTAL	24	9	--

Land and Water as Resources

The Citizen's Advisory Committee (CAC) and the general public responded very much alike on each of twelve statements concerning land and water as natural resources. Items included in this section of the questionnaire were developed not only to solicit the attitudes of the respondents towards land and water as natural resources, but as importantly, the items were designed to introduce the respondent to the subject content and the format for answering subsequent statements.

Both the CAC and the public recognized (Table 11) land and water as basic natural resources. Their responses indicate also that they agree with statements indicating historical as well as current misuse of land and water. The two groups were not only cognizant of abuse to land and water resources, but they also recognized (Table 12) that the quality of water is related to the proper use of surrounding lands. Although each person may have a somewhat different definition of "quality of life" as they perceive it, the respondents acknowledged (Table 12) that quality of life was related to the proper use of land and water resources.

Over one-half of both groups upheld the concept that ownership of land is not equated with power (Table 13), while about one-third of each group did not agree with that concept. Nearly one-third of the public also disagreed with the viewpoint of land as space for expansion (Table 13); however, an equal number of CAC (13) agreed and disagreed with that viewpoint.

TABLE 11

RESPONSES TO STATEMENTS ABOUT
LAND AND ITS USE AS A NATURAL RESOURCE

Response	Land and Water are Basic Resources				Land and Water Historically Misused				Land Resources Currently Wasted			
	Public		CAC		Public		CAC		Public		CAC	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Strongly Agree/Agree	196	99.5	28	100.0	155	80.3	24	85.7	167	85.2	26	92.9
Undecided	0	0.0	0	0.0	14	7.3	1	3.6	15	7.7	1	3.6
Strongly Disagree/ Disagree	1	0.5	0	0.0	24	12.4	3	10.7	14	7.1	1	3.6
TOTAL	197	100.0	28	100.0	193	100.0	28	100.0	196	100.0	28	100.0
	Chi square = 1.30 df = 1 p = 0.25				Chi square = 0.64 df = 2 p = 0.73				Chi square = 1.20 df = 2 p = 0.56			

TABLE 12

RESPONSES TO STATEMENTS ABOUT THE INTERRELATIONSHIPS OF LAND AND WATER RESOURCES WITH QUALITY OF LIFE

Response	Water Affected by Land Uses				Land and Water Use Related to Quality of Life			
	Public		CAC		Public		CAC	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Strongly Agree/Agree	183	92.9	28	100.0	188	95.9	28	100.0
Undecided	8	4.0	0	0.0	5	2.6	0	0.0
Strongly Disagree/ Disagree	6	3.0	0	0.0	3	1.5	0	0.0
TOTAL	198	100.0	28	100.0	196	100.0	28	100.0

Chi square = 2.11
df = 2
p = 0.35

Chi square = 1.19
df = 2
p = 0.55

TABLE 13

RESPONSES TO STATEMENT ABOUT PERSPECTIVES ON LAND AS A RESOURCE

	Land is Not a Sign of Power				Land is Space for Growth			
	Public		CAC		Public		CAC	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct
Strongly Agree/Agree	105	54.4	16	59.3	111	56.9	13	46.4
Undecided	15	7.8	2	7.4	13	46.4	2	7.1
Strongly Disagree/ Disagree	73	37.8	9	33.3	63	32.3	13	46.4
TOTAL	193	100.0	27	100.0	195	100.0	28	100.0

Chi square = 0.23
df = 2
p = 0.89

Chi square = 2.23
df = 2
p = 0.33

The CAC and the general public viewed land as a "national" (public) resource, rather than a "private" resource (Table 14). This finding indicates that the two groups did not adhere to the traditional private property rights concept that a property owner can use their land in any manner they desire. The two groups did not view the economic use of land (Table 15) as more important than improving the quality of the environment, and they overwhelmingly agreed that social and environmental concerns should be equally considered with the traditional economic considerations when formulating solutions to land and water resource problems.

Each of the twelve statements were scored with one of five values ranging from a value of 5 (strongly agree) representing a positive attitude to a value of 1 (strongly disagree) for a response toward a positive statement. In contrast, a value of 5 (strongly disagree) through a value of 1 (strongly agree) was assigned for responses to negative statements. Any one person's summed score on the twelve items could thus range from disagreement with all items to total agreement with all items. The individual scores of each public respondent were added together and the total was then divided by the number of public respondents to yield the mean (shown in Table 16). The same process was performed for the CAC respondents.

Then the t-test was used to determine if the aggregated mean attitudinal responses of the CAC and the general public differed significantly from one another. The null hypothesis that the means of the two groups did not differ was accepted (Table 16) for the twelve statements concerning land and water resources. Both for individual statements and for the examination of means, the CAC was representative of the general public.

TABLE 14

RESPONSES TO STATEMENTS ABOUT LAND RESOURCE MANAGEMENT

Response	Land Should be a Private Resource				Land Should be a National Resource			
	Public		CAC		Public		CAC	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Strongly Agree/Agree	75	38.5	6	22.2	134	68.7	20	74.1
Undecided	19	9.7	2	7.4	19	9.7	1	3.7
Strongly Disagree/ Disagree	101	51.8	19	70.4	42	21.5	6	22.2
TOTAL	195	100.0	27	100.0	195	100.0	27	100.0

Chi square = 3.36
df = 2
p = 0.19

Chi square = 1.06
df = 2
p = 0.59

TABLE 15

RESPONSES TO STATEMENTS ABOUT THE RELATIVE IMPORTANCE OF CONSIDERATIONS IN LAND USE MATTERS

	Economic Development Over Environmental Quality				Equal Importance for Economic Development, Social Well-Being, Environmental Quality			
	Public		CAC		Public		CAC	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct
Strongly Agree/Agree	43	22.2	7	25.9	180	90.5	25	89.3
Undecided	27	13.9	1	3.7	12	6.0	0	0.0
Strongly Disagree/ Disagree	124	63.9	19	70.4	7	3.5	3	10.7
TOTAL	194	100.0	27	100.0	199	100.0	28	100.0

Chi square = 2.25
df = 2
p = 0.32

Chi square = 4.57
df = 2
p = 0.10

TABLE 16

A COMPARISON OF PUBLIC AND CAC ON STATEMENTS ABOUT LAND AND WATER RESOURCES

	Number of Respondents	Mean of Summed Scores	Standard Deviation	t
Public	177	30.57	3.10	1.11^a
CAC	25	31.32	3.16	

[a] $p = 0.274$

Effectiveness of Land and Water Resource Governmental Institutions

Each respondent of the general public and the Citizen's Advisory Committee (CAC) was asked to indicate how effectively they believed that certain governmental institutions had made decisions concerning land and water resource matters. The institutions named were either agencies or political leaders holding institutional offices involved in land and water-related decisions at one of the following levels of government: federal; state; interstate (federal/state); intrastate (multiple-county); county; and local.

The CAC and the public believed that neither the United States Congress (Table 17) nor the following three federal agencies (Table 18) had been very effective: Corps of Engineers, Soil Conservation Service, and the United States Environmental Protection Agency. While both groups rated the effectiveness of these federal institutions average or below, the CAC rated the effectiveness of the Corps of Engineers (Table 18) lower than did the general public. The CAC rated the Soil Conservation Service as having performed in an average or above (40 percent) effectiveness capacity.

About one-half of both groups believed that Governor Rhodes (Table 19), the Ohio Legislature (Table 19), and the Ohio Environmental Protection Agency (Table 20) were average or above in their effectiveness; however, the Ohio Department of Natural Resources received an additional 25 percent of each group rating its effectiveness in a similar manner (Table 20). A majority of both the CAC and the general public were not informed well enough about the Ohio Land Use Review Committee to offer a rating (Table 19), whereas only one-fifth of both

TABLE 17

EFFECTIVENESS OF THE UNITED STATES CONGRESS

Response	Public		CAC	
	No.	Pct.	No.	Pct.
Very Well	5	2.6	2	7.7
Fair/Average	78	41.1	11	42.3
Poorly	74	38.9	12	46.2
Don't Know	33	17.4	1	3.8
TOTAL	190	100.0	26	100.0

Chi square = 4.77
df = 3
p = 0.19

TABLE 18

EFFECTIVENESS OF FEDERAL GOVERNMENTAL AGENCIES

Response	Corps of Engineers				Soil Conservation Serv.				U.S. Environmental Protection Agency			
	Public		CAC		Public		CAC		Public		CAC	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Very Well	19	10.4	1	3.8	32	16.8	11	39.3	18	9.7	6	22.2
Fair/Average	75	41.0	8	30.8	85	44.7	14	50.0	73	39.5	17	63.0
Poorly	46	25.1	17	65.4	15	7.9	3	10.7	44	23.8	4	14.8
Don't Know	43	23.5	0	0.0	58	30.5	0	0.0	50	27.0	0	0.0
TOTAL	183	100.0	26	100.0	190	100.0	28	100.0	185	100.0	27	100.0

Corps of Engineers: Chi square = 19.96, df = 3, p = 0.001

Soil Conservation Serv.: Chi square = 15.16, df = 3, p = 0.001

U.S. Environmental Protection Agency: Chi square = 14.45, df = 3, p = 0.002

TABLE 19

EFFECTIVENESS OF STATE OF OHIO EXECUTIVE AND LEGISLATIVE BRANCHES

Response	Ohio Governor Rhodes				Ohio Legislature				Ohio Land Use Review Committee			
	Public		CAC		Public		CAC		Public		CAC	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Very Well	10	5.2	1	3.8	3	1.6	0	0.0	5	2.7	1	3.7
Fair/Average	83	43.5	11	42.3	78	41.1	10	38.5	47	25.3	10	37.0
Poorly	60	31.4	9	34.6	69	36.3	10	38.5	15	8.1	2	7.4
Don't Know	38	19.9	5	19.2	40	21.1	6	23.1	119	64.0	14	51.9
TOTAL	191	100.0	26	100.0	190	100.0	26	100.0	186	100.0	27	100.0
	Chi square = 0.17 df = 3 p = 0.98				Chi square = 0.52 df = 3 p = 0.91				Chi square = 1.87 df = 3 p = 0.60			

TABLE 20

EFFECTIVENESS OF STATE OF OHIO GOVERNMENTAL AGENCIES

Response	Ohio Environmental Protection Agency				Ohio Department of Natural Resources			
	Public		CAC		Public		CAC	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Very Well	25	13.5	6	21.4	41	21.6	5	17.9
Fair/Average	80	43.2	8	28.6	95	50.0	16	57.1
Poorly	27	14.6	10	35.7	12	6.3	3	10.7
Don't Know	53	28.6	4	14.3	42	22.1	4	14.3
TOTAL	185	100.0	28	100.0	190	100.0	28	100.0

Chi square = 10.43
df = 3
p = 0.02

Chi square = 1.80
df = 3
p = 0.62

groups did not offer a rating on the other named governmental institutions.

Although the Great Lakes Basin Commission had been conducting the Maumee Level B Study within the area involved in this investigation, over one-half of the general public was not familiar enough with that interstate institution to rate its effectiveness (Table 21). The CAC members who had been involved in that two-year Level B Study were almost equally divided between a high and low rating, while a large majority adhered to a middle-of-the-road viewpoint.

TABLE 21

EFFECTIVENESS OF THE FEDERAL/STATE INTERSTATE GREAT LAKES BASIN COMMISSION

Response	Public		CAC	
	No.	Pct.	No.	Pct.
Very Well	16	8.5	5	17.9
Fair/Average	56	29.8	18	64.3
Poorly	15	8.0	4	14.3
Don't Know	101	53.7	1	3.6
TOTAL	188	100.0	28	100.0

Chi square = 24.74
df = 3
p = 0.001

Several governmental institutions at the regional (intrastate) and local level were rated. In most instances, generic names of institutions were used rather than specific names that would have been associated with only a limited geographic area. Of the regional and local institutions, the general public was less knowledgeable about the regional planning agency and the conservancy district (Table 22) than was the CAC. The CAC also tended to rate the effectiveness of these two institutions high as compared with the rating expressed by the public. As compared with other county-wide (Table 23) and local (Table 24) institutions, the general public knew the least about the regional planning agency and the conservancy district.

TABLE 22

EFFECTIVENESS OF REGIONAL INTRASTATE INSTITUTIONS

Response	Regional Planning Agency				Conservancy District			
	Public		CAC		Public		CAC	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Very Well	1	0.5	5	17.9	10	5.6	4	14.8
Fair/Average	33	17.9	15	53.9	43	24.0	12	44.4
Poorly	24	13.0	4	14.3	17	9.5	8	29.6
Don't Know	126	68.5	4	14.3	109	60.9	3	11.1
TOTAL	184	100.0	28	100.0	179	100.0	27	100.0

Regional Planning Agency: Chi square = 51.04
df = 3
p = 0.001

Conservancy District: Chi square = 25.13
df = 3
p = 0.002

The CAC members rated the effectiveness of both the soil and water conservation district and the county Cooperative Extension Service average or above to a much greater extent than did the public (Table 23). Although nearly one-half of the public were not well informed about the county Cooperative Extension Service, the CAC

TABLE 23

EFFECTIVENESS OF COUNTY-WIDE INTRASTATE INSTITUTIONS

Response	Soil and Water Conservation District				County Cooperative Extension Service			
	Public		CAC		Public		CAC	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Very Well	13	6.9	5	17.9	19	10.3	7	25.0
Fair/Average	86	45.7	17	60.7	63	34.1	16	57.1
Poorly	28	14.9	3	10.7	18	9.7	0	0.0
Don't Know	61	32.4	3	10.7	85	45.9	5	17.9
TOTAL	188	100.0	28	100.0	185	100.0	28	100.0

Chi square = 8.83
df = 3
p = 0.03

Chi square = 15.08
df = 3
p = 0.002

TABLE 24

EFFECTIVENESS OF LOCAL GOVERNMENTAL INSTITUTIONS

Response	Township Trustees				City Council			
	Public		CAC		Public		CAC	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Very Well	9	4.9	1	3.8	5	2.7	0	0.0
Fair/Average	59	32.1	5	19.2	54	29.3	6	22.2
Poorly	57	31.0	15	57.7	76	41.3	15	55.6
Don't Know	59	32.1	5	19.2	49	26.6	6	22.2
TOTAL	184	100.0	26	100.0	184	100.0	27	100.0

Chi square = 7.25
df = 3
p = 0.06

Chi square = 2.44
df = 3
p = 0.49

members were pleased with its performance; it was more effective than any of the other regional or local institutions.

The performance of township trustees and city councils was both little understood and disapproved by a majority of both groups of respondents (Table 24). The CAC members believed to a greater extent than did the general public that local government had been ineffective in land and water resource matters.

Effectiveness ratings offered by the respondents to the seventeen governmental persons or agencies were scored from a value of 1 for those indicating don't know, 2 for poorly, 3 for fair/average, and a maximum value of 4 for a rating of very well. The summed score of any respondent could thus range from a possible low of 17 (don't know on all 17 items) to a maximum of 68 (a very well rating on all items). The aggregate value was calculated for each respondent within each of the two groups, and the mean score was then derived for all public respondents and for all CAC respondents (Table 25).

TABLE 25

A COMPARISON OF PUBLIC AND CAC ON STATEMENTS ABOUT THE EFFECTIVENESS OF GOVERNMENTAL INSTITUTIONS

Group	Number of Respondents	Mean of Summed Scores	Standard Deviation	t
Public	150	36.44	10.19	4.68[a]
CAC	20	43.00	5.05	

[a] $p = 0.001$

The mean scores of the two groups of respondents was then compared through the use of the t-test. The significant difference between the mean scores of the two groups indicated that the CAC was not representative of the general public in their evaluation of the effectiveness of governmental institutions.

In general, the public was not as well informed as the CAC about the governmental institutions. Both groups of respondents, however, offered an effectiveness rating more often on federal and state institutions than they did for regional or local government. As well as displaying significant differences on their mean scores, the CAC and the public significantly differed on their responses to nine out of sixteen (56 percent) institutions rated. Overall, the CAC was not representative of the general public.

Roles of the Government and the Citizen in Land and Water Resource Decisions

The general public and the CAC respondents agree that the general populace should be supportive (Table 26) of improved land use management, but both groups also recognized that people may advocate an improved land use management activity until the proposed actions would directly affect the public. About three-fourths of the CAC agreed that the public is generally apathetic to land and water resource matters, while the public respondents were somewhat divided on that viewpoint.

About 90 percent of both groups of respondents believed that the public is not well informed about governmental actions concerning land and water resource matters (Table 27). Both groups were almost

TABLE 26

RESPONSES TO STATEMENTS ABOUT WILLINGNESS TO SUPPORT IMPROVED LAND USE MANAGEMENT

Response	General Public Should be Supportive				Public is Apathetic				Public Favors Until Directly Affected			
	Public		CAC		Public		CAC		Public		CAC	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Strongly Agree/Agree	174	88.8	27	96.4	108	54.8	20	74.1	180	90.0	28	100.0
Undecided	11	5.6	0	0.0	9	4.6	0	0.0	7	3.5	0	0.0
Strongly Disagree/ Disagree	11	5.6	1	3.6	80	40.6	7	25.9	11	5.6	0	0.0
TOTAL	196	100.0	28	100.0	197	100.0	27	100.0	198	100.0	28	100.0

Chi square = 1.92
df = 2
p = 0.38

Chi square = 4.09
df = 2
p = 0.13

Chi square = 2.77
df = 2
p = 0.25

TABLE 27

RESPONSES TO STATEMENTS ABOUT
INFORMATION AVAILABILITY FOR INVOLVEMENT OF THE PUBLIC

Response	Public is Well Informed				Increased Involvement If Notified in Advance				Government Should Better Inform Public			
	Public		CAC		Public		CAC		Public		CAC	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Strongly Agree/Agree	15	7.7	1	3.6	181	91.4	17	60.7	192	98.0	26	96.3
Undecided	6	3.1	1	3.6	7	3.5	2	7.1	3	1.5	0	0.0
Strongly Disagree/ Disagree	174	89.2	26	92.9	10	5.1	9	32.1	1	0.5	1	3.7
TOTAL	195	100.0	28	100.0	198	100.0	28	100.0	196	100.0	27	100.0
	Chi square = 0.63 df = 2 p = 0.73				Chi square = 24.86 df = 2 p = 0.001				Chi square = 3.12 df = 2 p = 0.21			

unanimous in believing that government should better inform the public about land and water plans and programs that may affect the people. While over 90 percent of the general public agreed that more people would become involved in land and water resource decisions if notified in advance of contemplated activities, only 60 percent of the CAC agreed (Table 27).

Contrary to the belief that more people would become involved if timely notified, the public respondents tended to suggest (Table 28) that land use decisions should be made by knowledgeable citizens selected to represent the public at-large. The public respondents were equally divided (44 percent) on whether to leave decisions to technical experts. The CAC agreed that the general populace should leave land use decisions to the discretion of selected knowledgeable citizens but the CAC disagreed that those decisions should be given to technical experts.

While over one-half of the CAC and three-fourths of the public believed that local elected officials made the best land use decisions (Table 29), both groups expressed discomfort with elected officials in general making land use decisions on their behalf. Despite the uneasiness about local elected officials making land use decisions, 8 out of 10 respondents in both groups strongly agreed that the local people (not necessarily government) should have more say in land use matters than either the federal or state government (Table 30). Although both groups of respondents favored more local control over land use decisions (Table 30), it was recognized that those decisions affecting a large number of people should be considered within a regional (multiple-county) context.

TABLE 28

RESPONSES TO STATEMENTS ABOUT THE INVOLVEMENT OF EXPERTS AND SELECTED CITIZENS IN LAND USE DECISIONS

Response	Leave Decisions to Technical Experts				Leave Decisions to Selected Citizens			
	Public		CAC		Public		CAC	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Strongly Agree/Agree	86	44.3	3	10.7	146	74.9	16	61.5
Undecided	23	11.9	3	10.7	20	10.3	4	15.4
Strongly Disagree/ Disagree	85	43.8	22	78.6	29	14.9	6	23.1
TOTAL	194	100.0	28	100.0	195	100.0	26	100.0

Leave Decisions to Technical Experts	Leave Decisions to Selected Citizens
Chi square = 13.06	Chi square = 2.09
df = 2	df = 2
p = 0.002	p = 0.35

TABLE 29

RESPONSES TO STATEMENTS ABOUT THE INVOLVEMENT OF LOCAL ELECTED OFFICIALS IN LAND USE DECISIONS

Response	Local Elected Officials Make Best Decisions				People Feel Comfortable About Elected Officials in Land Use Matters			
	Public		CAC		Public		CAC	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Strongly Agree/Agree	56	28.9	5	17.9	34	17.3	6	21.4
Undecided	27	13.9	2	7.1	32	16.2	6	21.4
Strongly Disagree/ Disagree	111	57.2	21	75.0	131	66.5	16	57.1
TOTAL	194	100.0	28	100.0	197	100.0	28	100.0

Local Elected Officials Make Best Decisions	People Feel Comfortable About Elected Officials in Land Use Matters
Chi square = 3.24	Chi square = 0.96
df = 2	df = 2
p = 0.20	p = 0.62

TABLE 30

RESPONSES TO STATEMENTS ABOUT THE LEVEL OF GOVERNMENT FOR LAND USE DECISIONS

Response	Local Should Have More Say Than State				Federal Should Have More Say Than State				Decisions Should be Regionally Oriented			
	Public		CAC		Public		CAC		Public		CAC	
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.
Strongly Agree/Agree	155	79.5	23	82.1	25	12.8	2	7.4	143	72.6	20	74.1
Undecided	20	10.3	1	3.6	28	14.4	1	3.7	31	15.7	3	11.1
Strongly Disagree/ Disagree	20	10.3	4	14.3	142	72.8	24	88.9	23	11.7	4	14.8
TOTAL	195	100.0	28	100.0	195	100.0	27	100.0	197	100.0	27	100.0

Local Should Have More Say Than State:
Chi square = 1.55
df = 2
p = 0.46

Federal Should Have More Say Than State:
Chi square = 3.45
df = 2
p = 0.18

Decisions Should be Regionally Oriented:
Chi square = 0.54
df = 2
p = 0.76

The CAC and the general public did not differ (Table 31) in their general feelings about the role of government and the citizen in land and water resource decisions.

TABLE 31

A COMPARISON OF PUBLIC AND CAC ON STATEMENTS ABOUT THE ROLE OF GOVERNMENT AND THE CITIZEN IN LAND RESOURCE DECISIONS

Group	Number of Respondents	Mean of Summed Scores	Standard Deviation	t
Public	180	32.30	2.82	0.[illegible]
CAC	25	32.84	2.88	

[a] p = 0.385

The CAC and the general public differed on their responses to two out of thirteen items about the role of government and the citizen in making land and water resource decisions, and there was not a significant difference between the mean scores of the two groups when aggregated scores were compared with the t-test (Table 31). The mean scores were obtained by assigning a value ranging from 5 (strongly agree) representing a positive attitude to a value of 1 (strongly disagree) to a positive statement; value assignments were reversed for responses to negative statements. A mean score was then calculated for each group by adding together the individual scores of all respondents within that group and dividing by the number of respondents within the group.

The CAC was representative of the general public in their overall attitudes about the role of the government and the citizen in land and water resource decisions.

Demographic Characteristics

One aspect of representation was the demographic characteristics of the general public and the Citizen's Advisory Committee (CAC). The two groups were compared on the following ten demographic characteristics: occupation, education, age, income, place of residence, property ownership, political office held, political affiliation, sex, and race. The CAC and the public were alike on 60 percent of the compared characteristics.

As might be expected from previous research discussed in an earlier section, the two groups differed on occupation, education, and income. Although the groups did not differ on age, they did differ on the holding of political office and political party affiliation.

The CAC members tended to be white collar persons with more education (Table 32) and higher family income (Table 33). While the blue collar worker comprised the largest occupational category (33 percent) within the general public, that segment was not present on the CAC. The CAC, however, was dominated by professional and technical persons with over twice the percentage of that category in the public respondents.

Over one-half of the general public had obtained up to twelve years of education (Table 32) with 5 percent completing not more than eight years. The CAC, with no one having completed less than 8 years of education, had less than 8 percent that had completed only through

TABLE 32

A COMPARISON OF THE GENERAL PUBLIC AND CAC ON DEMOGRAPHIC CHARACTERISTICS: OCCUPATION AND EDUCATION

Demographic Characteristics	Public No.	Public Pct.	CAC No.	CAC Pct.
OCCUPATION (Chi square = 25.37, p = 0.001)				
Skilled, semi- & unskilled worker	63	33.2	0	0.0
Professional & Technical	56	29.5	18	64.3
Clerical & Sales	15	7.9	1	3.6
Proprietor & Manager	18	9.5	3	10.7
Farmer & Farm Worker	4	2.1	3	10.7
Service Worker	5	2.6	0	0.0
Other (examples: retired, housewife)	29	15.3	3	10.7
TOTAL	190	100.0	28	100.0
EDUCATION (Chi square = 29.92, p = 0.001)				
1 - 8 years	10	5.0	0	0.0
9 - 11 years	19	9.5	1	3.6
12 (High School Graduate)	80	40.0	1	3.6
1 - 3 years of college	30	15.0	3	10.7
4 years (College Graduate)	24	12.0	8	28.6
Over 4 years of college	37	18.5	15	53.6
TOTAL	200	100.0	28	100.0

Group	Number of Respondents	Mean Years of Completed Education	Standard Deviation	t
EDUCATION				
Public	192	13.36	2.96	6.96*
CAC	27	16.48	2.05	

*p = 0.001

TABLE 33

A COMPARISON OF THE GENERAL PUBLIC AND CAC ON DEMOGRAPHIC CHARACTERISTICS: AGE AND INCOME

Demographic Characteristics	Public No.	Public Pct.	CAC No.	CAC Pct.
INCOME (Chi square = 14.16, p = 0.01)				
Under $5,999	11	6.0	0	0.0
$ 6,000 - $ 9,999	21	11.5	1	3.8
$10,000 - $14,999	51	27.9	3	11.5
$15,000 - $24,999	68	37.2	10	38.5
$25,000 - $49,999	25	13.7	9	34.6
$50,000 or Over	7	3.8	3	11.5
TOTAL	183	100.0	26	100.0
AGE (Chi square = 5.32, p = 0.62)				
Under 19	1	0.5	0	0.0
20 - 24	10	5.0	0	0.0
25 - 29	25	12.5	0	0.0
30 - 39	36	18.0	8	28.6
40 - 49	36	18.0	6	21.4
50 - 59	35	17.5	6	21.4
60 - 64	21	10.5	2	7.1
65 or Over	36	18.0	5	17.9
TOTAL	200	100.0	28	100.0

Group	Number of Respondents	Mean Age	Standard Deviation	t
AGE				
Public	193	46.86	16.03	0.45^*
CAC	27	48.15	13.85	

* p = 0.659

high school. Over 90 percent of the CAC members had some amount of college education with over one-half having more than 4 years of college.

The CAC had no one who had earned less than $6,000 per year. While nearly one-half of the general public earned up to $15,000 each year (Table 33), the same percentage of the CAC earned above $25,000

Persons under the age of 30 years were not present (Table 33) on the CAC. Respondents from the general public were rather uniformly distributed throughout each of the age categories. Nearly one-fourth of both groups consisted of persons over 60 years of age.

The general public respondents were primarily urban-oriented home owners (Table 34) as was about one-half of the CAC members. The CAC members had a stronger rural orientation, especially for the rural farm community, than did the general public.

TABLE 34

GENERAL PUBLIC AND CAC DEMOGRAPHIC CHARACTERISTICS: PLACE OF RESIDENCE AND PROPERTY OWNERSHIP

Demographic Characteristics	Public		CAC	
	No.	Pct	No.	Pct.
PLACE OF RESIDENCE (Chi square = 6.44, p = 0.04)				
Rural Farm	17	8.7	6	21.4
Urban (city or town)	133	68.2	13	46.4
Rural Non-farm	45	23.1	9	32.1
TOTAL	195	100.0	28	100.0
PROPERTY OWNERSHIP STATUS (Chi square = 1.84, p = 0.40)				
Own	165	83.3	26	92.9
Rent	29	14.6	2	7.1
Lease	4	2.0	0	0.0
TOTAL	198	100.0	29	100.0

The CAC members had been much more politically active (Table 35) in elected offices than had the public respondents. While one-fourth of the CAC had held a political office at some time, less than 5 percent of the public had done so.

TABLE 35

GENERAL PUBLIC AND CAC DEMOGRAPHIC CHARACTERISTICS:
POLITICAL OFFICE, POLITICAL AFFILIATION

Demographic Characteristics	Public		CAC	
	No.	Pct.	No.	Pct.
HELD POLITICAL OFFICE (Chi square = 13.97, p = 0.001)				
Yes	8	4.1	7	25.0
No	188	95.9	21	75.0
TOTAL	196	100.0	28	100.0
POLITICAL AFFILIATION (Chi square = 6.97, p = 0.03)				
Democrat	79	42.7	7	25.9
Independent	56	30.3	6	22.2
Republican	50	27.0	14	51.9
TOTAL	185	100.0	27	100.0

A majority of the CAC was affiliated with the Republican party (Table 35), whereas over 40 percent of the general public was aligned with the Democratic party. While about 22 percent of the CAC were Independents, over 30 percent of the general public held such an affiliation.

Males responded more often than did females (Table 36) for both groups. However, while three-fourths of the public respondents were males, about two-thirds of the CAC respondents were males. Caucasian persons dominated both groups of respondents with only 1.5 percent of the public respondents and none of the CAC respondents being Black (Table 36).

TABLE 36

GENERAL PUBLIC AND CAC DEMOGRAPHIC CHARACTERISTICS: SEX AND RACE

Demographic Characteristics	Public		CAC	
	No.	Pct.	No.	Pct.
SEX (Chi square = 0.49, p = 0.48)				
Male	149	76.0	19	67.9
Female	47	24.0	9	32.1
TOTAL	196	100.0	28	100.0
RACE (Chi square = 0.06, p = 0.81)				
White (Caucasian)	191	98.5	27	100.0
Black (Negro)	3	1.5	0	0.0
TOTAL	194	100.0	27	100.0

The CAC and the general public differed on 6 out of 10 of the demographic characteristics using the Chi square statistic and they differed on education (Table 32) with the t-test of mean differences as well. The CAC was thus not representative of the general public on demographic characteristics. In comparison with the general public, the CAC members were better educated, higher income earners, and employed in white collar occupations. The CAC also contained a greater percentage of persons associated with the Republican party and who had held political office at some time. The CAC was not representative of the general public in terms of demographic characteristics.

V. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Problem

Public participation in land and water resource matters is a multiple-faceted concept which has been relatively unexplored when compared with other scientific and technological aspects of land and water resources. One facet of public involvement, which was focused upon in this investigation, concerns the representation of the general public in land and water resource matters. Whether a small, selected group of people involved in land and water resource programs, plans, and decision matters do or do not represent the attitudes and demographic characteristics of the larger, relatively uninvolved general public of a geogrphic area is not well understood and has not been widely investigated. This investigation was designed to advance knowledge in this facet of public involvement through a determination of whether the selected Maumee River Basin Level B Citizen's Advisory Committee (CAC) was representative of the Maumee River Basin residents. The specific objectives were:

1. to determine the attitudes of both groups of respondents toward land and water resources, effectiveness of governmental leaders and agencies (institutions) involved in land and water resource decisions, and the role of the citizen and the government toward land and water resource matters;
2. to describe the demographic (socio-economic) characteristics of both groups; and
3. to determine whether the CAC was representative of the general public.

Procedure

The research problem was approached through the development of a questionnaire designed to solicit attitudinal responses from individuals and to collect information about the respondents' demographic characteristics. The questionnaire was disseminated through three sequential waves of mail to all CAC members and to a random sample of residents within the Maumee River Basin. Telephone follow-up responses of a random sample of general public non-respondents were compared with responses from the general public respondents. All questionnaire items were coded, keypunched onto computer cards, and analyzed through the use of the Statistical Package for Social Sciences program.

Findings

The Citizen's Advisory Committee (CAC) members and the general public were both cognizant of land and water as natural resources, the historical and current misuse of those resources, and the close relationship between the two resources. There was a general attitude that land was a resource in which the public should have some influence in its use. While there were mixed feelings about land as strictly an economic commodity, there was a general feeling that the use of land and water resources should include equal considerations for environmental quality, economic benefits, and social needs. In general, the two groups held much the same positive attitudes toward land and water resources.

Overall, neither of the groups believed that governmental leaders and agencies had been very effective in their handling of land and water resource matters. The effectiveness of federal and local governmental institutions were rated average or below by both groups, the regional intrastate institutions were the least understood of all institutions by the general public, and a majority of both groups believed that Ohio legislative and executive agencies and leaders were average or above in their effectiveness. The performance of local governmental leaders was both little understood and disapproved by a majority of both groups. A majority of the general public could not offer a rating of effectiveness for either the Ohio Land Use Review Committee or the Great Lakes Basin Commission. The CAC members were usually either more critical or more favorably pleased than was the public toward the effectiveness of institutions. About one-fifth of both the CAC and the public respondents were not informed well enough about governmental leaders and institutions to offer a rating of their effectiveness of leaders and agencies.

Although the CAC and the public thought that government did not adequately inform the general populace about land and water resource plans and programs, they both felt that generally people were willing to support better land use management. Both groups indicated that land and water resource decisions should be made at the local level as opposed to the federal or state level of government. Neither group believed that the local elected officials made the best decisions in such matters. However, both groups of respondents felt that the general populace would feel comfortable about being represented by knowledgeable citizens in those matters. The CAC members and the general public generally agreed on the role of the citizen and the government in land and water resource decisions.

The CAC members included more white collar persons with higher educational achievements and higher incomes that did the general public. The two groups were similar in age distribution. Both groups were primarily homeowners. While the public respondents were primarily urban residents, the CAC members were almost evenly divided between urban and rural residents. The CAC members had been more politically active than had the general public. The CAC members were not representative of the general public on demographic characteristics.

Conclusions

The Citizen's Advisory Committee was representative of the general public of the Maumee River Basin in attitudinal responses to statements about land and water resources and about the role of the citizen and the government in land and water resource decisions matters, but were quite different in their evaluations of the effectiveness of governmental institutions. The two groups were also quite different in their demographic characteristics.

The extent to which the attitudes and demographic characteristics of a citizen's advisory committee (CAC) reflect those variables in the general public in land and water resource matters can be determined. The "representativeness" of public involvement can be measured through the development and use of mail questionnaires.

While it might be ideal for a citizen's advisory committee to represent the attitudes and the demographic composition of the general public an implication of such considerations is that it can be impractical, infeasible, impossible, or not necessary. A citizen's advisory committee that helps formulate public opinion may be more helpful towards advancement and support of needed measures than would the general public. A CAC may be most effective by leading and helping shape public attitudes rather than merely reflecting those of the general public.

Recommendations

One predictable aspect of research is that it identifies further areas or voids in knowledge that need to be explored. Inevitably, research generates further research. The present investigation is no exception. Public involvement in land and water resource program decisions is a little understood concept and relatively unexplored subject. This investigation into the "representativeness" aspect of public involvement in such contemporary and increasingly important matters has provided better insight into an area of paramount concern to many people, officials, and agencies. Further systematic research on various aspects of public involvement is long overdue and needed. The following areas of public involvement related to this study should be researched in an effort to advance our understanding of the human aspect of natural resources management.

Detailed studies should be made into the relationship between attitude held by the general public toward various issues and concepts in land and water resource management and the level of knowledge of those persons about such items. This research would help determine whether such attitudes are based upon affective situations (example, parental attitudes) or upon knowledge about the subject; if the latter would be discovered, the source(s) of such knowledge should be identified and analyzed.

An investigation is needed to determine which governmental programs or activities have been most influential in shaping the attitude of the person toward their evaluation of the effectiveness of the governmental leader or agency most directly involved in that activity. Such an investigation should further identify the specific elements of that program or activity that helped mold that attitude and the relative impact each of those elements had upon a person's attitude formation. Identification of those elements and their impact could help governmental leaders and agencies improve their effectiveness as perceived by the general public. Improvement of that image could consequentially lead to greater support from and involvement by the public in land and water resource activities.

The attitudes, knowledge, and demographic characteristics of the professional land and water resource managers and administrators within governmental agencies should be determined and compared with the same variables obtained from the general public and advisory groups. This type of investigation could help identify where and how changes could be made in governmental organization and administration and in institutional arrangements to help improve the effectiveness of performing land and water resource responsibilities.

Additionally, there are other areas of research in public involvement that should be investigated in an attempt to further understanding. Among those areas are the following.

The public's attitude toward and knowledge about policy instruments (examples: regulations, zoning, and taxation) that could affect land use and water resources management should be assessed. The policy instruments should include both voluntary compliance and involuntary regulation measures. This assessment would identify for public institutions the measures which the public are most likely to accept, measures about which there are misconceptions, and measures about which the public is not well informed. Utilization of such information could help alleviate misunderstanding and unnecessary conflicts between the governmental institution and the general public.

The types of content of media and other sources (examples: newsletters, newspapers, television, and friends) that provide factual information or help formulate the public's attitudes about land and water resource matters should be analyzed. This effort could identify and evaluate the impact of various public relations and education activities sponsored by governmental institutions in conjunction with specific programs and overall activities. The results could assist in improvement of both public relations and educational approaches to the general public.

Performance criteria and evaluation measures for assessing the effectiveness of land and water resources programs need to be developed. Currently, there are no known criteria that are both comprehensive and widely accepted. Until such operational criteria and measures are developed, tested and accepted, the effectiveness of public involvement in various related but identifiably distinct land and water resources activities and programs cannot be realistically compared with any degree of certainty.

APPENDIX A

RESEARCH QUESTIONNAIRE

I. LAND AND WATER RESOURCES

_ _ _ _ _ _ _

Your feelings about the following kinds of land and water resources matters could help solve several of the problems concerning the quality and use of these natural resources. Please circle the response that best fits your feeling on each item. An example has been provided for your help.

SA - Strongly Agree	D - Disagree
A - Agree	SD - Strongly Disagree
U - Undecided	

Example:

Land is a resource that is limited in amount. [✓ SA] A D SD U

1. Land and water are basic natural resources. SA A D SD U
2. Americans have misused land resources. SA A D SD U
3. Land should be considered a "private" resource since it belongs to only the land owner. SA A D SD U
4. Americans have used land and water unwisely. SA A D SD U
5. A high quality of life is related to the proper use of land and water resources. SA A D SD U
6. The quality of water depends a lot upon the uses that are made of the surrounding land. SA A D SD U
7. Land should be considered a "national" resource since its use by one person may affect others. SA A D SD U
8. Unwise use of land, such as letting storm water carry soil into streams, is a waste of a resource. SA A D SD U
9. Land should be considered as space for growth and development. SA A D SD U
10. Ownership of land is not a sign of power. SA A D SD U
11. The economic use of land should be considered more important than improving environmental quality. SA A D SD U
12. Solutions to land use and water resource problems should equally consider the economic, social, and environmental concerns. SA A D SD U

II. LAND AND WATER RESOURCES INSTITUTIONS

Please place a check mark (✓) across from each of the following persons or groups to indicate how well you feel that each is dealing with land and water resources matters.

Person or Group	Very Well	Fair/ Average	Poorly	I Have Not Heard About This Person or Group	Don't Know/ No Opinion
Example: State of Texas		✓			
1. President Ford					
2. Ohio Governor Rhodes					
3. U.S. Congress					
4. Ohio Legislature					
5. Corps of Engineers					
6. Ohio Land Use Review Committee					
7. Township Trustees					
8. Soil Conservation Service					
9. Ohio Dept. of Natural Resources					
10. Great Lakes Basin Commission					
11. County Cooperative Extension Service					
12. Ohio Environmental Protection Agency					
13. Multiple-county Regional Planning Agency					
14. Conservancy District					
15. U.S. Environmental Protection Agency					
16. City Council					
17. Local Soil & Water Conservation District					
18. Other (Please name): ____________					

III. DECISIONS ABOUT LAND AND WATER RESOURCES

Please circle the response that best fits your feeling on each item.

SA - Strongly Agree
A - Agree
U - Undecided
D - Disagree
SD - Strongly Disagree

1. The general public should be willing to support better land use management. SA A D SD U
2. People don't care what a property owner does with his land and water as long as it does not bother them. SA A D SD U
3. People are often in favor of improved land use management until such restrictions directly affect them. SA A D SD U
4. The local people should have more say in land use decision matters than should state government. SA A D SD U
5. The general public is well informed about governmental actions concerning land and water. SA A D SD U
6. The federal government should have more say in land use matters than should state government. SA A D SD U
7. More people would become involved in decisions concerning land and water if they knew about these decisions ahead of time. SA A D SD U
8. People feel comfortable about their elected officials speaking for them on land use matters. SA A D SD U
9. All governmental agencies in general should better inform the public about land and water plans and programs that will affect the people. SA A D SD U
10. People without technical knowledge about land and water resource decisions should leave the making of these decisions to the experts. SA A D SD U
11. A group of citizens who know about land and water matters should be selected to speak for the general public in these decision matters. SA A D SD U
12. Local elected officials generally make the best land use decisions because of their closeness to the people and the individual situation. SA A D SD U
13. Land and water resource decisions affecting large numbers of people should be made at the multiple-county level. SA A D SD U

IV. In order to place your answers with others in this survey, we would like to know . . . .

1. At which occupation do you make a living?

☐ Skilled Worker (craftsman, etc.)	☐ Farmer
☐ Professional & Technical	☐ Service Worker
☐ Semi- and unskilled Worker	☐ Farm Worker
☐ Clerical & Sales	☐ Other: ________________ (name)
☐ Proprietor & Manager	

2. Please circle the last year of school that you completed.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 Over 18

3. Is this survey being completed by

	Male	Female
Head of Household	☐	☐
Other Household Member	☐	☐

4. Have you ever been elected to a political office? ☐ Yes ☐ No

5. You were born in ________________ (month) 19____

6. The land on which you live is ☐ Owned, ☐ Rented, or ☐ Leased by you.

7. About how much is your total family income each year before taxes?

☐ Under $1,999	☐ $6,000 to $7,999	☐ $15,000 to $24,999
☐ $2,000 to $3,999	☐ $8,000 to $9,999	☐ $25,000 to $49,999
☐ $4,000 to $5,999	☐ $10,000 to $14,999	☐ $50,000 or more

8. Do you live . . ☐ on a farm ☐ in a city or town ☐ in a rural area, but not on a farm

If you live on a farm, what percentage of your annual income before taxes is from the farm?
☐ Less than 50% ☐ Greater than 50%

9. With which political sector do you identify?

☐ Democrat	☐ Never Decided	☐ Other: ________________ (name)
☐ Independent	☐ Republican	

10. Your race is

☐ White or Caucasian	☐ American Indian
☐ Black or Negro	☐ Other: ________________

11. Through which of these sources do you hear the most about land and water?

☐ Magazines	☐ Television	☐ Friends & Associates
☐ Radio	☐ Newspapers	☐ Other: ________________ (name)
☐ Organizational Newsletters		

12. To which charity do you wish a $1.00 "Thank You" donation sent?

☐ American Cancer Society	☐ American Heart Association
☐ March of Dimes	☐ Muscular Dystrophy (Jerry Lewis)

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